

**A STUDY ON SIGNIFICANCE OF MEDICINAL PLANTS IN INDIAN
SCRIPTURES**

Thesis submitted

By

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Dated

NOVEMBER 2012

CERTIFICATE

This is to certify that this thesis entitled **A study on significance of medicinal plants in Indian scriptures** submitted by Karthik H C for the award of degree of Doctor of Philosophy in Sanskrit is the result of bonafide research work carried out by him at CISRS (Center for Inter-disciplinary Studies and Research in Sanskrit, Canara College, Mangalore) under my guidance and direct supervision

I further certify that this thesis has not previously formed the basis for the award of any Degree, Diploma or Fellowship of any other University or Institution

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DECLARATION

I declare that the thesis entitled **A study on significance of medicinal plants in Indian scriptures** is a bonafide record of research work done by me under the guidance of Dr Ramachandra G Bhat, Retired associate director of Center for Inter-disciplinary Studies and Research in Sanskrit, Canara College, Mangalore This thesis has not formed the basis for the award of any Degree, Diploma or Fellowship previously

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dedicated to

my

beloved parents

Indological Truths

Abbreviations

| | |
|---------|------------------------------|
| A B | aittareya brāhmana |
| Ay K | ayodhyakānda |
| A V | atharvaveda |
| Ar K | aranyakānda |
| B D | bhaishajya dhanvanatarī |
| B G | bhagavdgītā |
| B P | bhāvaprakāśa |
| B S | brhat samhītā |
| C S | caraka samhītā |
| K K S | kāśyapīyakrsīsūkta |
| M S | manusmṛti |
| Ma U | mahānārayana upanīsat |
| M U | mundaka upanīsat |
| N P U K | nāradiya purāna uttara kānda |
| P N P | pavitra nurvāna paddhati |
| R N | rājanughantu |
| R V | rgveda |
| Ra V | rājavallabha |
| S B | śathapatha brāhmana |
| S R B | subhāsita ratna bhāndāgāra |
| S S | suśruta samhītā |

| | |
|-----|---------------------|
| S R | śabdaratnāvalī |
| T A | taittirīya āraṇyaka |
| T B | taittirīya brāhmaṇa |
| T H | tridośahara |
| T S | taittirīya saṃhitā |
| V A | vrkṣāyurveda |
| V V | viśvavallabha |
| Y V | yajurveda |

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A STUDY ON SIGNIFICANCE OF MEDICINAL PLANTS IN INDIAN SCRIPTURES

Aims and objectives of the study:

If there is anything uniquely Indian it is the *vedas*. *Vedas* form to be the most scientific and magnum-opus scriptures gifted to the world literatures. This work is a miniature contribution to the world of researches on the *vedic* scriptures. This work is a sincere effort to compile the plants and tree species existing in the *vedas* and to show their modern relevance in the lights of modern medicine.

Lots of scholars at a global level, especially in the field of botany and medicine, have started to dig deep into the *vedas*, and unearth relevance of this kind of research and publish the same to the current world through different mediums.

At this juncture this work is only to enhance my own research abilities and develop a new perspective in interpreting the *vedas* and its allied branches. I have relied more on *vedic* scriptures rather than other scriptures like poetries or medical treatises, which are also a major store houses of knowledge in the context of variety of ancient plants and tree species.

The primary objective of the work is basically to cull out as many plants and tree species from the *vedic* lore and prove their efficacy in the modern world and especially to the modern medical science.

Here, a lot of research articles are reviewed and are done so to prove how the ancient plants are empirically accepted in the field of modern medicine. As a student of indology, my knowledge in the medicinal aspects is average. But, in the company of doctors and my own personal interest to learn anatomy and physiology and some aspects of pathology I was motivated to take up this research. The training I had in

Sanskrit in a traditional *gurukulam* system¹ for about six years facilitated in reading the Sanskrit scriptures of *caraka* and *suśruta* in its original source. Culmination of all these has led to the preparation of this thesis. The study of *vedas* and allied branches has given me a comprehensive idea about the trees and plant species existing in the *vedic* literature. With the kind of background I have, it is obvious for me to know the usage of these trees and plants species from the sacrificial perspective and ecological perspective. Because sacrifices and ecology are the two core essences of *vedic* literatures.

The first chapter's major chunk is the variety of plants and tree species in the *vedas* and their usefulness in the sacrifices. There is an introduction to *yajña* and the implements used for the fulfilment of the same and also an introduction in particular to *somayajña*. Variety of plants and tree species were used in the *yajñas* and above all *soma* is a very rare species and it is today only information as it doesn't exist. Though a lot of speculations are going around saying people have found *soma* plant, it is only an exaggerated fact as many scholars term different plants as *soma* unfortunately with ulterior motives. The second chapter is a very detailed introduction to prove how still *agnihotra* is relevant from the societal perspective and how it is the only source of *vedic* material available for the purification of the nature, especially at a juncture when nature is going beyond redemption due to man's greed. *Agnihotra* is the one of the major tools that can be put into practical purpose through which medicinal plants can be used and also *vedas* can be revived. The third chapter is a compilation of possibly all the plants and tree species in the *vedic* literature. Here in the work the medicinal uses of the plants are given and those are very few based only on the popularity of the trees and also based on my ability to grasp whatever little from the Sanskrit sources based on medicinal plants. The *veda mantras* are as it is delineated and their meanings are given. Apart from the reference to the *vedic* plants a few other plants and tree species from the other

¹ Veda Vijnana Gurukulam, Chennahalli, Bangalore, <http://www.vvgurukulam.org>

Sanskrit literatures like *vrksāyurveda*, *kriśīpavāśara*, *kāśyāpīyakṛsisūkta*, Etc , are culled out for elaboration in the same chapter Whereas the fourth one is to show how a lexicon like *amarakośa* is a treasure house in which botany is hidden as a source book for upcoming researches in this field The conclusive chapter deals with the growth of the agriculture and botany in India based on the *vedic* literature and starting from the *vedic* period The declension and the reason for it are also cited as is cited the growth and the reason of the growth before it started to decline and fade away completely The solution for the same is difficult considering the changes at the global level, but it is not impossible if people in India collectively grow, to first of all develop self-respect in whatever prosperous ancient literature they have and slowly and eventually turn back to the traditional methods without giving up on what is new and sensible

Chapter 1:

Relevance of medicinal plants and yajña in modern era

Yajñāyudha - Implements of Sacrifice

The *brāhmaṇa* texts not only specify the *mantras* that must be recited and precisely indicate the acts that must be performed in the several sequences, but also prescribe the forms and functions of the furniture, vessels, utensils, implements, and other articles that are used in the sacrifice. Most of them are wooden, and the trees from which wood may be had to make them are also specified (*palāśa*, *khadira*, *udumbara* etc.) These vessels or utensils and implements are collectively called ‘*yajñāyudha*’- ‘the weapons used in *yajña*’

Taittirīya-saṃhitā enumerates ten *yajñāyudhas*, and explains that all *yajña* is accomplished by them

अनयैवैनाः प्रणयत्यस्कन्नहविर्भवति य एवं वेद यज्ञायुधानि सं भरति यज्ञो वै यज्ञायुधानि यज्ञमेव तत् स
भरति यदेकमेकगं सम्भरेत् पितृदेवत्यानि स्युर्यत् सह सर्वाणि मानुषाणि द्वे द्वे सं भरति याज्यानुवाक्ययोरेव
रूपं करोत्यथो मिथुनमेव यो वै दश यज्ञायुधानि वेद मुखतोस्य यज्ञः कल्पते स्मः॥ च कपालानि
चाग्निहोत्रहवणी च शूर्पं च कृष्णाजिनं च शम्या चोलूखलं च मुसलं च दृषच्चोपला चैतानि वै दश यज्ञायुधानि
य एवं वेद मुखतोस्य यज्ञः कल्पते यो वै देवेभ्यः प्रतिप्रोच्य यज्ञेन यजते जुषन्तेस्य देवा हव्यम्
हविर्निरूप्यमाणमभि मन्त्रयेताग्निम् होतारमिह तग् हुव इति॥²

² TS 1682 & 3

1 Kapāla - *haviradhīśrayanārthāni*

Small thin clay saucers round in shape on which the *purodāśa* cakes are baked for offering *purodāśa* is prepared by taking four fist-fulls of paddy which are cleaned in a wicker basket (*nrvāpa*), it is then pounded (*avaghāta*), husked, and ground, it is mixed with water and laid flat on the *kapāla* in the shape of a tortoise (viz circular in shape) The *kapāla* is placed on the fire, and the *purodāśa* is baked The baked *purodāśa* is stored in a container called *īda* While making oblations, clarified butter (*ājya*) is poured on the cakes Different gods are presented with *purodāśa* - offerings separately on *kapāla* Texts prescribe the number of *kapālas* for each god *varuna*, for example, is eligible for one *kapāla*, the *aśvins* two *kapālas*, *visnu* three, *agni* eight, *agna-vaisnava* (*agni* and *visnu* together) eleven, and *agna-śomiya* (*agni* and *soma* together) also eleven

2 Śūrpa -

Flat winnowing basket square in shape with two corners on one side rounded off, for holding the grains This is used for cleaning the grains before they are ground and powdered The material out of which this must be made is variously given as reeds (*iśīka*) mango-leaves (*āmra-patra*), *Arundo tibialis* (*nada*), long-stalked grass (*kuśa*, *Poa cynosuroides*), or cane (*venu*) Its prescribed size is also variously given 24, 20 or 18 *angulas*

3 Krsnājina -

The black antelope's hide used for the sacrificer to sit upon, and for the mortar (*ulūkhala*) and pestle (*musala*) for pounding grain to be placed on It also figures during the consecration (*dīksā*) of the sacrificer in *somayāga*

4 Ulūkhala - (*avaghātasya ādhārabhūtam*)

A wooden mortar, used for pounding the grains or crushing soma shoots, It is cylindrical with a bowl-like depression (*bila* or *numnam*) at the top, it is narrow in

the middle (*madhyasamgrahita*) Its length and other particulars are not given, but it is usual for an *ulūkhala* to be knee-high The text says that it can be of a desired or convenient length (*iccāpramāna*) It is made of *khadira* (Acacia catechu), *vārana* (Crataeva roxburghii), *udumbara* (Ficus glomerata), or any other sacred tree In *agnicāyana*, it is four-cornered

5 Musala -

The pestle made of *khadira* or *palāśa*, used for pounding (or husking) the grains or the *soma* shoots placed in the *ulūkhala* It is prescribed to be three *aratni* in length and one *musti* (fist) in breadth and has an iron plate at its base

6 Drsad -

Also called *grāva*, it is a large stone slab (*pattah*) on which are placed the *soma* creepers, to be crushed or ground (*pesanārtha*) with the help of *upala*

7 Upala -

Also called *adri*, it is a smaller mill-stone resting on the *drsad*, it is used for crushing or grinding the *soma*-creeper, placed on the *drsad* These two are used in the *soma*-rituals, and also for pounding the grains for the *purodāśa*-cakes But they are regarded as *soma*'s 'weapons' and used during 'somābhisavana' ritual

8 Sphya (*chedanādikrt*)

A wooden sword used for cutting the *darbhā*-grass to the required size, for marking the lines in the sacrificial ground and for stirring the boiled oblations It is made of *khadira* wood (Acacia catechu), and is a cubit long (1 *aratni* = 24 *angulas*) In varieties of the sacrifice *īājasūya* (like *matī ā-bārhaspatyestī*), no separate altar is constructed, the natural ground is used as altar Here the *sphya* is used for removing the surface soil (*uddhanana*), viz removing the upper layer of mud, digging the earth (*khanana*), and marking the area of the altar (*parilekhana*)

9 Śamya (*gadayā sadī śī bāhuparimitā*) -

A wooden peg or, stick or staff, shaped like a mace measuring a *bāhu* or thirty-

six *angulas* It is a measuring device, used along with *sphyra* (which is used to mark the lines) (*sphyena antarlīkhatī*), in this case there is a vertical slit in the *śamya* (or a hollow depression called 'garīta') It is made of *khadira* wood (*Acacia catechu*) or *vārana* (*Crataeva roxburghii*)

10 Agnihotrahavanī

A large wooden ladle used for making oblations into the fire It is a variety of *sruk*, and is prescribed to be made in *vaikamkata* (*Flacourta sapida*) wood It is one *bāhu* (36 *angulas*) in length Besides these ten, which are specifically mentioned as *yajñāyudhās*, there are many other utensils and implements which are used in a sacrifice, - different kinds of ladles (*sruk*), a variety of containers (*graha*), bowls (*sthālī*), pitchers (*kalaśa*), cups (*camasa*), milk-pails (*pinvana*), planks (*phalaka*), sickles (*asida*), hoes (*abhri*), hammers (*vighana*), tongs (*śapha*), fans (*dhavitri*), carts (*śakatās*) and stools or chairs (*āsandi*) The form of a utensil was not only suited to the function it was designed for, but was in accordance with some mystical symbolism of ritualistic significance, it would also be artistic The *brāhmaṇa* texts and the *śrautasūtra* manuals provide all the information on these particulars The *yajña*

yajñāyudha vary according to the sacrifice Those used principally in the *somābhishavana* sequence are not used in *pravargya*, for instance Therefore, the functional significance of an implement used becomes important Ladles, bowls, cups and containers have different forms, according to the primary nature of the rituals in which they are employed Sometimes the classification of *yajña*-articles is made on the basis of what they are intended to contain or carry For instance *ulūkhala*, *musala*, *kṛsnājina*, *drśad-upala* and so on are called *purodāśa-patīās* because they are associated with the making or storing the *purodāśa*-cakes *Kumbhi*, *sakha-pavitra*, *abhidhānī* and *dohanapātra* are instances of vessels called *sannayyapātras*, viz associated with procuring and keeping milk and curds (*dadhi-payo-rūpa-sannayya*)

Ladles:

The most common ladles used in *yajña* are *sruk* and *sruva*. *Sruk* is a long ladle, a *bāhu* (36 *angulas*), an *aratni* (24 *angulas*) or a *pradeśa* (12 *angulas*) in length, made of a sacrificial wood. It has a bowl or depression (*puskara*) on top of it at one end with a beak (Shaped like elephant's lips or swan's beak) for the liquid to be poured out (*prasecana*), the tail portion of the ladle (or handle) will be in the form of crow's tail (*vāyasa-puccha*). There is a regulation that the front part of the ladle should be the top portion of the wood, while the rear part should be the bottom portion (facing the root of the tree).

Sruk:

‘There are several variant forms of ‘*sruk*’ like *juhū*, used for offering oblations supported by *upabhṛt*, and along with *dhruva*, *pracaranī* used in offering oblations in *somayāga*, and *agnihotrahavanī* used in *agnihotra*. The *juhū* is made of *parna* (*Butea frondosa*) wood, *upabhṛt* of *aśvattha* (*Ficus religiosa*), *dhruva* of *vaikamkata* (*Flacourtia sapida*), *pracaranī* of *palāśa* (*parna*) and *agnihotrahavanī* in *vaikamkata*. According to *āpastambha*, *sruk* is to be made of *śamī* wood (*Prosopis spicigera*), or alternately in gold. *Rauhinahavanī* is another variety of *sruk*, made of *udumbara* wood (*Ficus glomerata*) and a *bāhu* (viz 36 *angulas*) in length, with a small bowl carved out at one end. Two of them are used in the *pravargya* ritual to offer the *rauhinapurodāśa*. The *sruk* represents the female principle or *prakṛti*.

Sruva:

Sruva is a smaller ladle used for offering liquids. It is an *aratni* (24 *angulas*) in length, and the bowl (*puskara*) is a small one, its diameter being not more than the tip of the thumb of the sacrificer's hand. It is made of *khadira* wood (*Acacia catechu*) or of *parna* wood (*Butea frondosa*). In the *pravargya* ritual, it is prescribed to be made of *udumbara* (*Ficus glomerata*). In magical rites it may be made in gold,

silver or copper The *sruva* represents *purusa* or the male principle

Vasordhārā:

A variety of ladle (which means the flow of wealth') used in *agnicāyana* and is meant for continuous and uninterrupted offering of melted clarified butter (*ājya*) into the fire for a specific duration (represented by the chanting of the mantras) *Baudhāyanaśrautasūtra* (10 54) prescribes that its front half should be in the form of a *sruk* (ladle), but that the rear portion should accommodate a *camasa* (bowl) The purpose is to have a steady stream of ghee (*āpastambhaśrautasūtra*, 17 17 8 *santatam vasordhārām juhoti*) The actual device has a long slender drain from the bowl to the beak (the implement being a *vyāyāma* or 96 *angulas* in length), sometimes, two bowls are provided, for elegance and for ensuring steady supply the rear bowl being larger than the one in front The offering symbolises the unbroken stream of prosperity by returning the *ājya* to *agni*, and through *agni* to the *devatā* intended

Pranita:

The *pranita* is a wooden vessel in which consecrated water is kept While making *purodāśa*, water from this vessel is mixed with the flour The vessel is also meant to store *soma*-juice It is made of *nyagrodha* (*Ficus indica*), *rauhitaka* (*Andersonia*), *varana* (*Crataeva roxburghii*) or *vikankata* (*Flacourtia sapida*) wood The vessel is square in shape, eight *angulas* long and broad, and four *angulas* high, the bowl is three *angulas* deep, and holds about half a *prastha* of water

Proksanī:

The *proksanī* is the vessel made in *varana* wood (*Crataeva roxburghii*) or *vikankata* (*Flacourtia sapida*), and with a long handle The vessel is 12 *angulas* long, and has a depression shaped like a lotus-leaf (*padmapatrākṛti*) or lotus-bud (*kamalāmukulākṛti*) It holds the holy water, used for consecrating (*proksanam*, - asperstion) the articles and the oblations Into the water are dropped the *darbhā* blades (*Saccharum cylindricum*) to make the water holy

Pistapātrī:

The flour for making *purodāśa*-cakes for oblation is stored in *pistapātrī*, a container made of *vārana* wood (Crataeva voxburghii) or in clay. It is also called *pistodvapanī*, and according to some it must be 20 *angulas* long and broad, with a circular depression to hold the dough, others say that its size must be 24 *angulas* long and broad (*aratnimātra*). More usually it is rectangular in shape. According to *sāyana*, however, it can be of any shape but only made of clay. If it is a wooden vessel, it has a handle. A vessel similar in shape (oblong, but corners rounded off and narrow in the middle) is *idāpatra*, one *aratni* (viz 24 *angulas*) long, and with a handle. It is used for keeping the materials for oblations. It is made of *varana* wood (Crataeva voxburghii).

Pistodvapanī:

The baked *purodāśa*-cakes are kept in this vessel which is square in shape, *pradeśa* (viz 12 *angulas*) long and broad, the depth of the depression in the middle is six *angulas*.

Dronakalaśa:

This is a large vessel made of strong and hard wood like *vārana* or *vikankata* for storing the *soma*-juice, it is a trough (*drona*), square or circular in shape, with a handle (*dandayūta*). It may alternately be shaped like a boat (*naukākara*).

Pariplu: (or *udancana*)

A small wooden bowl (*laghupātra*) shaped like a *sruk* (but without a handle) (*yathāsruk adanda*), is employed to take *soma* juice out of *dronakalaśā* for 28 purposes of oblation (*dronakalaśāt somagrahanayogya*). And the *soma*-juice that is stored in *dronakalaśa* is already strained and ready for offering and drinking.

Daśāpavitra:

The device to strain the *soma*-juice. It is a fringed strainer, made from a piece of cotton cloth to which in the centre is attached or woven a round piece of woollen cloth. This is placed on the *dronakalaśa* and *soma*-juice is poured into it, the

strained soma-juice collects in the *dronakalaśa*

Grahas:

The nine wooden cups which contain the *soma*-juice are made in various shapes, but generally, they resemble the form of a hour-glass, a span high, but narrow in the middle. Their names are *upāmsūgraha*, *antaryāmagraha*, *aindravāyavagraha*, *maitrāvarunagraha*, *aśvinagraha*, *śukragraha*, *manthigraha*, *ukthyagraha* and *ādityagraha*. *Dadhī*, *amśu* and *adabhyagrahas* are four-cornered

Camasas:

These are the *soma*-offering cups which are cared for by a special priest known as *camasādhvaryu*. Ten of these cups are mentioned, one for each of the priests who offer *soma*-juice as oblation. Their shapes differ so that the cup meant for the priest is easily identified. The participants after whom the ten-*camasas* are known, viz, *hoti*, *brahma*, *yajamāna*, *udgātr*, *praśāstr*, *brāhmanāccāsmi*, *potr*, *nestr*, *acāvāk*, *agnīdhra*, *sadasya*. The cups are made in *udumbara* wood (*Ficus glomerata*), *nyagrodha* (*Ficus indica*), *rauhitaka* (*Andersonia*), or *vārana* (*Craeteva roxburghii*). They are generally square in shape and have handles.

Sthāli:

Various kinds of clay bowls *agnihotra-sthāli* which holds the fresh milk (*godohana*) is prescribed to be made by the hand of the sacrificer or one of the officiating priests. *Ājyasthāli* is for holding the ghee, likewise there are *prasadājyasthāli*, *carusthāli*, *dhruvasthāli* and *āgrayanasthāli*.

Mahāvīrā:

This vessel is described as ‘the head of a sacrifice’ (*makhasya śirah*), is used in *pravargya* ritual. It looks like three pots placed one above the other being symbolic of the three worlds — the earth, the astral world and the transcendental realm (*bhūh*, *bhuvah* and *suvah*). Symbolised by the three *vedic* metres *gāyatrī*,

trustubh and *jagatī*, (*traya ime lokāḥ andobhiḥ karoti*³), The *mahāvīra* is a cauldron a span high (*pradeśamātra*), and it is also known as *agharma* (hot clay pot) used for boiling milk. Because it is a boiler, it is difficult to handle it with bare hands, a pair of tongs (*śapha*) are used for lifting it from the fire and placing it upon another vessel *upayamanī* by name (or *śaphopayamana*). This implement is meant to be a support for *śapha*, and is a long ladle (one *bāhu* or 36 *angulas* long) with a fairly large depression (*mahāpuskaram srucam*) to hold the base of the *mahāvīra*. This is made of *udumbara* wood (*Ficus glomerata*).

Śapha:

The tongs (two of them, *śaphau*) are also made of *udumbara* wood and are shaped like claws *samdarśākārau*), they are long in shape and meant only to hold the *mahāvīra* vessel (*mahāvīragī ahanārtha*).

Aranīs:

The fire that is used in the sacrifice must be produced by friction of sticks of the *aśvatthah* tree (*Ficus religiosa*) which has grown in close association with the *śamī* tree (*Prosopis spicigera* or *Mimosa suma*) (*āśvalāyana-śrauta-sūtra* 2.1.16-17). Both these trees are invested with great spiritual significance, *śamī* especially is regarded as the 'mother of fire' (*agni-garbha*). The tree called *aramka* (*Premna spinosa*) is also mentioned as suitable for this purpose. The expression *arani* suggests the process of producing fire by 'turning round' (or by 'fitting one stick into another', viz the stick-and-groove method). The fire may be produced by friction or contrition, by rubbing one stick over another, or by a simple apparatus such as the fire-drill. All references are to two *arani*'s which are described as the two mothers of *agni*, who is '*dvi-mātr*⁴' (having two mothers), the symbolism is of the two births of *agni*, who is '*dvi-janma*' ('born twice'), one in the heavens and the other on earth. This is represented in the two *aranīs*, one 'lower' (called

³T A 8.3.22

⁴ त्वमग्ने प्रथमो अङ्गिरस्तम कविर्देवना परिभूषशि व्रतम्। विभुर्विश्वस्मै भुवनाय मेधिरे द्विमात शयु कतिधा चिदायवे R.V. 1.31.2

adhararātri) and the other 'upper' (*uttararāmi*) In the *somayāga* context, the two *arani*'s are known by the names of the celestial nymph *urvaśi* and her hero-lover *purūravas* The lower *arani* signifies the female aspect, while the upper one is male The kindling of fire is thus an act of procreation

Miscellaneous Implements:

Upaveśa:

The sacrificial fire is stoked by a wooden (*udumbara* or *pālāśa* branch) stick, one *pradeśa* (viz , 12 *angulas*) or one *aratni* (24 *angulas*) long, and the head of which is shaped like an extended palm (*hastākṛti*) It is called *upaveśa* or *drsti*

Dhavitra:

The sacred fire is fanned by the *dhavitra* each of the three priests in *gharma* oblation using one It consists of a stick of bamboo (*venu*) or *udumbara* (*Ficus glomerata*) to which is fastened a piece of black antelope's hide

Āsandi:

A high throne upon which the *soma* creepers are stacked in the *yāgaśālā* after the purchasing (*soma-vikraya*) *Soma*, the philosophical concept as well as the actual creeper, play an important role in *yajña* *Soma* is regarded as *rāja* - the monarch and is thus installed upon the throne During the coronation ritual, the earthly ruler imitates *indra*, the lord of the celestial beings and is seated upon a wooden throne called *āsandi* and is duly consecrated The *āsandi* used for the *soma*-creepers is thus called *rājāsandi* It is placed at the southern side of the *āhavanīya kunda* It is made of *udumbara* wood (*ficus glomerata*), the four legs of the seat as high as the sacrificer's navel (*nabhi-daghnah pādāni*) and the portion above being an *aratni* (viz , 24 *angulas*) high (*aratni-matranī śīrsāni*) The seat is prepared by *muñja*-grass ropes (*mauñji-rajju*, *Saccharum sara*) It is covered by black antelope's skin (*kṛsnājina*) A slightly taller *āsandi*, known as *saṃrādāsandi*, is placed to the

east or north of *rājāsandi*, and on this are kept the *mahāvīra* pots, the *upayamani* ladle and other articles

Kūrca:

Kūrca strictly means a bunch of *kuśa*-grass (*Poa cynosuroides*) But the *kūrca* used in a sacrificial ritual is a small elongated plate made of *kuśa*-grass or from *vārana* wood (*Crataeva roxburghii*), a *bāhu* (viz 36 *angulas*) in length and made in the shape of a tortoise (*kūrma*), or dolphin (*makara*) It is kept on the western side of the *āhavanīya* hearth, and the sacrificial ladles (*sruca*) when not used are placed upon it

Yūpa:

In sacrifices where animals are killed, the *yūpa* (sacrificial stake) is used It is a pillar carved out of *khadīra* wood (*Acacia catechu*), *bilva* wood (*Aegle marmelos*), *palāśa* (*Butea frondosa*), *aśvattha* wood (*Ficus religiosa*), *udumbara* wood (*Ficus glomerata*) or *kramuka* wood (*Areca faubel*) The height of the *yūpa* varies according to the *yajña*, - 17 *aratnis* in *vājapeya*, nine to 21 *aratnis* in *agnistoma* and 9 *aratnis* in *paśubandhah* The base of the *yūpa* is one *aratni* in height and is buried underground, this part may also be equipped with an iron ring (*yūpamūle nihita loha-valayam*) called *yūpakataka* The *yūpa* may either be cylindrical in shape (*vartulam śobhanah*) or square or it may be octagonal The *yūpa* is so called because the sacrificial animal is fastened to it (*yūpyate yuyate asmin iti*) One top of the *yūpa* is a detachable mount (*vrsamaulīkah*), made of wood or prepared out of wheat flour called *caśāla* The *yūpa* represents the 'Axis Mundi' or centre of the universe

Meksana:

This is a rice-stirring spatula also used for offering oblations to the manes It is either made of sacrificial wood or metal *Pinvana* milk-pails *āsida* knife for *darbhā*-cutting *vighana-mudgara* the hammers *abhisavana-phalaka* soma-pressing boards

Thus after elaborating the possibly all implements of a sacrifice, let us now

know as to what is sacrifice and what is in specific *soma* sacrifice and how it is performed using all these implements. The implements alone are not emphasized, but the whole sacrifice with its *modus-operandi* is delineated herein, along with a brief introduction to different kinds of sacrifices its uses.

There is a story in *aitareya-brāhmaṇa* that explains - In the beginning *prajāpati* created *yajña*, and consequently *brahma* (the priestly functions or spiritual sovereignty) and *ksatra* (the temporal sovereignty) came into being. (Owing to some reason), the *yajña* fled from them, but they pursued the *yajña*, with their own weapons. Now what were the weapons of *brahma* (or the priests)? The utensils and implements used in the *yajña*. And the weapons of *ksatra* (or the princes) were horses, chariots, armours, arrows and bows. When the *ksatra* pursued the *yajña* with its weapons of warfare, the *yajña* ran faster, being scared, and the *ksatra* had to return without catching up with the *yajña*. But the *brahma* pursuing it was successful; it reached the *yajña* and prevented its further flight. *Yajña*, however, looked at the 'weapons' that the *brahma* carried, and recognised them as its own 'weapons', it consented to stay with the *brahma*. This is how the *yajña* has settled down with the priestly class. The princeling's approached the priests and desired also to possess *yajña* for their own benefit. The priests thereupon counseled them to put aside their weapons of warfare and approach the *yajña* as priests with its own 'weapons' (viz. the *yajñāyudha*). The princeling's accordingly cast aside their weapons of warfare and assumed the form of priests, carrying the priestly weapons and obtained the *yajña*.

An introduction to the vedas and the sacrificial part of the vedas:

Vedas are known to be limitless⁵ in its nature, that they are all encompassing and that they cover all. The *vedic* scriptures are treasure houses of knowledge. Man has for centuries been sitting on a golden vessel called the *vedas*, and has never tried

⁵ अनन्ता वै वेदा

to use the resources available inside it, as he has been so indulged in either intellectualizing it or debating on it from whatever little he has understood it based on his limited experiences which were driven by his egotistic thoughts. As a result the knowledge of the same today is biased, though essentially it is pure and pristine. As the word *veda* signifies knowledge, so also the scriptures and texts that are the off-springs of the *vedas* contain vast and limitless knowledge, which is intended to bring welfare for the mankind. It is this limitless knowledge that has been passed on from generation to generation, in the *gaurāṅgīyapaṇḍita*, a knowledge chain, which is unprecedented in history of the world culture. It has been estimated that the *vedas* are the only system which goes beyond mistakes and is the only knowledge form which has not been deteriorated especially in its way of pronunciation. A system of knowledge preservation so intact, that it has helped keep the sanctity of the wisdom unbroken. Never before in history has ever been a system that was designed to preserve and protect the most sacred of the entities in human culture.

It is said that the *vedas* are the rudimentary form of knowledge which has laid out specific principles on which human civilization irrespective of time frame on the earth can be imbibed, inculcated and indulged into. However, unfortunate that men or a small community of human beings because of their greed and craving for power have made it caste-restrained and inaccessible to the mankind. At the same time, it is heartening that people all over the globe have started to revisit the Indian gamut of knowledge hidden in the *vedas* without any prejudice and making it available to the mankind through different modes. Man is now becoming more aware of the fact that it is a natural asset that anyone can be a custodian of the same.

The sacred scriptures contain countless information that is not only beneficial for human survival and prosperity, but actually essential. The *vedic* hymns are the rich repositories of solutions to man's greatest of problems and greatest of social turmoil and chaos.

The tendency in today's world is to adapt the existing knowledge to suit the lifestyle, to the convenience and thereby derive solutions for man's instantaneous and endless wants. By such a quick fix method the problems cannot be eradicated at a grass root level, rather it is just a superficial attempt to bring down the intensity of the problem momentarily. On the contrary, it is fundamental to understand, that we have to accustom to suit the style of living as described in the scriptures to get the true, maximum and optimum benefits of the same. This in any way doesn't suggest that *vedas* are perspective about which will be dealt in the upcoming passages.

The *vedas* are said to be *apauruseya*, which means not created by humans or not born out of human mind, as anything constructed out of human mind is biased and prejudiced. They are said to be of a natural origin. They were revealed unto the highest of *sādhakas* in the state of deepest meditation.

The most important and the fundamental message of the *vedas*, is undoubtedly, the *yajña*. Man prone to execute random activities in his routine has been subject to fickleness and mental disturbances. *Yajña* as a regular activity can weed out the randomness and instill regularity and thus enhance the ability to pursue any one form of activity for a longer duration.

There are a lot of misconceptions regarding the *yajña* system. They are being considered as a ritualistic process which doesn't yield too much, which is again the deepest of the misconceptions drilled into the human minds with vested interests from a group of people.

Rather, *yajña* is a way of injecting into the atmosphere positive and rich nutritive ingredients through the agency of fire. Human have so far been able to pollute all the other elements, but he has never been able to pollute fire, and energy as it cannot be created, but only passed from state to state. The fire element has the capacity and power to cleanse the other four natural elements of the nature.

Yajña is a method of healing the atmosphere and filling it with *prāna*, or energy in the empirical scientific terms, which is the essential life force in all, things living. Thus, performance of *yajña* creates atmosphere that is conducive to positivity and health.

The Meaning of yajña:

The *sanskṛta* word '*yajña*' is derived from the verbal root *yaj* which means 'to worship', 'to sacrifice', or 'to bestow'. There is no specific English equivalent as the term *yajña* has a number of meanings depending upon the context in which it is used. The *sanskṛta* words are known to be very flexible. Apparently, it is simple, but from within it is equally complex, if not read and understood by developing a deeper knowledge of the language as per the traditional rules. It could mean either 'a sacrifice', or 'a sacrificial rite', or 'an act of worship', or 'a pious or devotional act (one of the five which every householder has to perform)', or 'of *agni*', and lastly 'of '*viṣṇu*'. Thus there are multiple meanings attached to the term *yajña* which convey different aspects of this broad concept. *Yajña*, in the general sense, is any *karma* done in the spirit offering such as worshipping, praying, remembering, meditating, and so on. More beautiful is the meaning of the word, only when such work is performed without one interspersing his or her selfish motives. It is the selfless act which makes the whole idea refreshing, especially in a world which is driven by profits and gains. In the specific sense, it represents the performance of rituals ordained in the *śāstras* for propitiating the *devatās* and invoking their divine help for various reasons and sometimes for no reasons.

A sacrificial rite instituted according to the *vedic* rules with all the necessary approved ingredients and performed according to the prescribed order of actions and in accordance with the *śāstras* is called a '*yajña*' and not otherwise. Both the words *yajña* and *yāga* are synonymous though the former is more often used in the context of sacrifices performed in the house at the *grhastha's* (householder's) level while

the latter refers to major sacrifices performed in specially built places involving a large number of participants, who are well versed in the knowledge of the same

Yajña is known to be the most apt, authentic and scientific tool for attaining the primary objective of the human existence the happiness *Yajña* is one of the primary essences of the *vedas* The fundamental concept of *yajña* in *hindu* religion and philosophy has always been that the *yajña* is a god-given expedient by means of which humanity can directly invoke the of the Gods, firstly to attain the objects of human existence, secondly to overcome the hurdles in the path of human emancipation and final liberation Form the very beginning, the practical rituals connected with all *yajña* was developed on the basis of certain fundamental concepts propounded by our ancient *ṛsis*

Firstly, that man must seriously consider his place and status in the environment and his role in the cosmic scheme of things Secondly, man must live in harmony with nature by considering the cyclical nature of in the nature's scheme of things⁶ This only means that man at some point of time has to comprehend the true nature of the inter-dependence between him and the different components of nature and there is also a need for man to regulate all his actions in accordance with the principles of sustainability Tertiary aspect being that man must monitor his desires and actions in accordance with the principles of human existence always bearing in mind the need to progress towards final emancipation from all problems at the phenomenal level, divine level and at the spiritual level, i e , *ādhibhautika ādhidarvika ādhyātmika* In other words, man must attain internal parity as well as external parity Fourthly, man must use every available avenue to surrender profoundly, and connect with the nature intimately to the divinity and exhibit his sense of gratitude for the bounties of nature and for all the help and grace received

⁶ *yajñacakra*

It is not a hyperbolic statement to say that *vedic* culture evolved keeping the concept of the *yajña* at the core of all activities. The human-drive link provided by the medium of *yajña* was designed to enable mankind to obtain the help of the gods for various external as well as internal goals. Some of the external goals sought through the *yajña* are good healthy crops, cattle of high caliber, normal and pleasant weather, progeny, sound health, wealth of all kinds at different levels, which is an overall prosperity. Examples of internal goals are unadulterated happiness, mental peace, internal purification, internal transformation and internal refinement, atonement and so on. But ultimately it is the building of a more secure, structured, organized and systematic society in which everyone is day in day out thinking of each other's all round welfare. Happiness, from the societal perspective is a dependent factor. People can be happy only when people around them are happy.

The Classification of yajña:

Over four hundred types of *yajñas* are described in the Vedas. *Yajñas* have been classified in various ways. The *bodhāyanagrhyasūtras*^{1/1/18/21} contain a description of the system of *yajñas* as a whole as follows:

“*Yajñas* can be classified into twenty one groups. They are performed in conjunction with the recitation of *mantras* from the three *vedas*, namely the *ṛig*, *yajur*, and *sāma*. The materials used for the oblation are products of domesticated and wild animals as well as of various plants, trees. The emoluments paid to the priests are a way of distributing the wealth in a systematized way. *Yajñas* can also be classified into four categories, namely, *svādhyaya*, *japa*, *karma*, and *mānasaya*. Each succeeding *yajña* gives result ten-folds better than that of previous one. This is a vague belief accepted in the scholarly fraternity with a scholarly interpretation.

Svādhyayayajña, is the study and recollection of the *vedas* learnt under the tutelage of an able *guru*. Whereas, *japayajña* is famously known as the one-pointed repetition of certain *veda* mantras. Here again the classification is two-fold, one being *āhata* (manifested, in the sense, an oral way of chanting the *mantras*) and *anāhata* (unmanifested, in the sense, a mental way of chanting the *mantras*). *Karmayajña* is the performance of the sacrificial rites associated with the various *yajñas* in concordance with the *śāstras*. *Mānasayajña* is the performance of a *yajña* entirely in the mind using various appropriate mental constructs and concepts, thoughts, resolution, mental offerings and meditations, which should be eventually stopped only after the attainment of a state which is beyond all kinds of *yajñas*.

With regards to the *karmayajñas*, for all practical purposes, it is sufficient to understand the classification of twenty six *yajñas* as follows -

- 1 The *pañca māha-yajñas* -5
- 2 The *sapta pāka-yajñas* -7
- 3 The *sapta havir-yajñas* -7
- 4 The *sapta soma-yajñas* -7

The pañca māha-yajñas:

A *grhastha* or householder is enjoined to perform five *yajñas* as a duty. These are called the *pañca māha-yajñas*. In these *yajñas*, appropriate offering are made to *devās* and the *rsis*, the *pitrs* (the manes or departed ancestors), fellow creatures and men. They are called the *deva-yajña*, *rsi-yajña*, *pitṛ-yajña*, *bhūta-yajña* and *manusya-yajña* respectively.

Sāyanācārya a great saint of 14th century and one of the greatest scholars in the context of commentating on the *vedas*, while explaining different *vedic* texts tells that it is to be practiced by every individual all the time. These five are called *mahāsatis*, the great sessions, because these are performed everyday till the end of

one's life, by the *grhastha* himself, without looking for a priest to conduct it on his behalf *Sāyanācārya* also explains that *bhūtayajña* involves taking out a portion of food, with the resolve that it reaches the *bhūtas* and keeping it aside for them *Devayajña*, involves offering of food to the fire, for the sake of different *devas*, with their ritual invocation *Pitryajña* involves the giving away of food till the pot is empty, while *manushyayajña* means to serve the humanity in different possible ways and make this society a better place to live. The ancient scriptures use terms like *ista pūrta* and *data*, as the essence of this *yajña*. The last and the most important being *brahmayajña* is the learning of the *vedas* and all the allied scriptures, not to just protect them but also to practice them.

The sapta pākayajñas.

As the term *pāka* implies, in the *pāka yajñas*, cooked offering such as boiled grains blended with butter are offered in the *aupasanāgni* or the *grhyāgni* which are the sacred fires lit up and duly consecrated at the time of marriage. The seven *pāka yajñas* are *astaka sthālīpāka parvana śrāvaṇa agrahāyaṇa cauri* and *āśvayujī*. These rituals are for material gains and prosperity.

The sapta-havir yajñas:

The *havis* is an oblation (generally uncooked) that is poured into a duly consecrated *vedic* fire. It consists of ingredients such as barley, rice, milk or clarified butter. The seven *havir-yajñas* are *agnyādheya agnihotra darśapūrnāmāsa cāturmāsya āgrayana nirūdhapaśubandha* and *sautrāmaṇi*. These *yajñas* are performed in the three *śrautāgnis* namely *gārhapatya āksina* and *āhavanīya*.

The sapta soma yajñas:

As stated earlier, *yāga* is a major sacrifice that is performed in a spacious location in which the elaborate infrastructure for the *yāga* is constructed and which

involves the participation of many priests and other participants. This group of *yāgas* is called *co* because the juice of the soma plant is the main ingredient of the offering in all these *yāgas*. The *soma yāgas* are *agnistoma atyagnistoma ukthya sodasī vājapeya atirātī a* and *āptoryāma*.

It should be noted that *aupāsana* and *agnihotra* are part of the daily religious routine. Though a *pāka yajña*, *aupāsana* is not included in the group of seven *pāka yajñas* mentioned above. *Agnihotra* is one of the seven *havir yajñas*. *Darśapūṇamāsa* is a *haviryajña* to be performed once in fifteen days. The other five *haviryajñas* and the seven *somayajñas* are to be performed.

As if out of consideration for us, the *smṛtis* have granted us the concession that the difficult *somayajñas* need to be undertaken only once in a lifetime, if frequenting the same is physically and mentally challenging. *Somayajñas* have to be performed yearly once and if the performance of the same on an yearly basis becomes difficult, once in life time at least such a gigantic *somayajña* has to be performed. The gigantism of the same can be understood if one goes through the words of the *smṛtis*.

But for the *parvanī-śrāddha* is to be mandatorily performed once in thirty days and the *sthālīpāka* every *prathama*, the other five *pāka yajñas* are to be performed once a year. In short, the injunction of the *śāstras* is that the five *mahāyajñas* together with *agnihotra* and *aupāsana* are part of everyday rituals, the *darśapūrnamāsa* and *sthālīpāka* once a fortnight, and the *parvanī-śrāddha* monthly once. The other *yajñas* are to be conducted once a year if possible or at least once in a lifetime.

The yajña rites:

Most of the rituals are performed through *vedic* priests according to the rules laid down in the *śruti* which is “the heard” while others are performed by *grhasthas* or

householders according to the *grhyasūtra* and assisted by the wife in many cases. Men don't have independence in any the performance of the rituals. The *vedas* proclaim it strongly⁷

The *śulbasūtras* shed light upon planning and constructional and building aspects of the *vedī*. One should always bear in mind that the *vedī* is rather vaguely translated as 'altar' in English and it bears no similarity whatsoever with the altars found in a Church. The *vedī* is the place where the sacred fire will be placed and around which all the priests sit.

The *śrautasūtras* written by the below listed *ṛsis* deal with the elaborate procedures for performing the *vedic* rites connected with *yajñas*. They represent apparently many different ways of performing rituals, which are with all unflinching will and staunch belief followed by different communities according to their traditions which are named after the authors respectively- Here are a few important names who have laid down the tradition, *āpastamba*, *āśvalāyana*, *baudhāyana*, *bhāradvāja*, *kātyāyana* and *satyāsādha*. There are many others whose tradition is less followed or whose works are not available due to many reasons.

The *dharmasūtra* of *āpastamba* forms a part of the larger *kalpasūtra* of *āpastamba*. It contains thirty *praśnas*, which literally mean 'questions' or chapters or divisions conveniently made to represent the knowledge system systematically. The ideas of these *dharmaśāstras* are well organized and are yet preserved in good condition. But, the certain amount of doubt about the interpolation or addition of *ślokas* still exists. These *praśnas* comprise of the *śrautasūtras* followed by *mantrapāṭha* which is used in domestic rites and is a collection of ritual formulas, the *grhyasūtra* which deals with domestic rituals and lastly the *śulbasūtra* which are

⁷ अयज्ञो वा एष योऽपनीक

the principles of geometry needed for the comprehensive comprehension of the *vedic* rituals

The *śulbasūtras* are part of the larger repositories of texts called the *śrautasūtras*, considered to be appendices to the *vedas*. They are to be believed as the only source which is similar to modern computing and can be fancily called Indian mathematics existing from the *vedic* period. Unique fire-alter shapes were associated with unique gifts endowed on the humans from the gods. For instance, “he who desires heaven is to construct a fire-alter in the form of a falcon”, “a fire-alter in the form of a rhombus”. We will deal with the fire-alters in detail later.

The four major *śulbasūtras*, which are mathematically the most significant, are those composed by *baudhāyana*, *mānava*, *āpastamba* and *kātyāyana*, about whom very little is known. The oldest are the *sūtras* written by *baudhāyana* around 800 BCE to 600 BCE. *Baudhāyana* was an Indian mathematician, who was also a priest in all probability. The richness of the book forces us to infer about his priestliness. He is noted as the author of the earliest *śulbasūtras* called the *baudhāyana-śulbasūtras*, which contained several important mathematical or computational results. He is older than other famous mathematicians like *āpastamba* and others. However, he belongs to the *yajurveda* school of thought.

The *baudhāyana-śrautasūtras* is a late *vedic* text dealing with the solemn rituals of the *taittirīya* school of the *kṛsnayajurveda*. *Baudhāyana*, the traditional author of the *sūtras*, originally belonged to the *kānva* school of the *śukla-yajurveda*. The *grhyasūtra* of *bharadvāja* is not widely known, as it is never quoted in the *mānandhas*. The school allied to the followers of *bharadvāja* tradition, whose roots may have been in Southern India, declined and faded away permanently.

The *śrauta* rites are much more elaborate compared to *grhya* rites since the aims of the former extended far beyond the purposes of a household. The *śrauta* rites laid

particular emphasis on the necessary articles for each sacrifice and their usage during the sacrifice. Particular attention was given to how the various actions were to be performed and how the participants had to conduct themselves throughout the *yajña*. The *vedi* of the sacrificial ground was systematically arranged in an arena suitable for that specific purpose according to what the ritualistic literature prescribed. All this will be dealt with in greater detail in the upcoming passages.

The objectives of a yajña:

Although a *yajña* has many implications, it broadly includes three significant elements: worshipping the gods as an act of gratitude, realizing a close proximity with the divine or supernatural beings and, embracing *dāna* or giving as a way of life. An act of gratitude- we owe nature, our environment, the *pañcbhūtas* (five elements) and the gods for our existence and sustenance in the form of the food that we eat, the air that we breathe and the water that we drink. In return for these blessings, people in ancient times performed *yajña* as an act of worship with offerings, reverence and gratitude. In the *vedic* age, several gods were invoked as the many forms of the one *paramātmān*. They included *agnī* (the fire god), *indra* (the rain god), *vāyu* (the wind god) and *varuna* (the water god), to name a few. Solar energy fused with thought power was the force that transferred the worship to the gods through ether. An act of connection- as finite beings, we cannot have direct access to the infinite on account of our many limitations. It is only through subtle means that we can relate with the divine. *Yajña* was truly a miraculous discovery with its various ways and means to reach out to the higher realms of consciousness. It was for this reason that the ancient seers included *yajña* as an integral part of their daily activities. An act of giving- *yajña* reflects giving as a way of life. The notion of giving in a *yajña* pertains to the desire and ability to offer both material and spiritual benefits to fellow beings. In this context, offering food to the hungry is

yajña Inspiring others to follow the path of purity and righteousness is *yajña*, and so on

In the *bhagavadgītā*⁸, *śrī kṛṣṇa* explains to *arjuna*, “In the very beginning of creation, *prajāpati* (The Lord of all beings) having created man along with sacrifice said-‘by this sacrifice you shall grow and prosper. Let this sacrifice be the yielder (the divine cow *kāmadhenu*) of the coveted objects of desire.” But was the concept of a sacrifice propounded by the Supreme Lord merely to enable human beings to fulfill their personal desires, personal pleasures and enjoyments? He foresaw that they would be incapable of attaining the major ends of human existence. Being supremely compassionate and desirous of helping them, he created them together with the expedients of the sacrifice so that they may perform sacrifices as his worship and told them- ‘by this sacrifice shall you prosper and multiply. May this sacrifice fulfill your supreme object of desire called *mokṣa* (final liberation from worldly existence) and also your other desires that are in conformity with it.” That then was the real aim of the *para-brahman* when he created human beings together with the expedient of the sacrifice. As we shall see, human beings ran into problems when this god-given expedient was misused for personal ends that were not in conformity with the highest aim.

How should this expedient of sacrifice given to man by the Supreme Lord be used to prosper and progress towards the main goal? *Śrī kṛṣṇa* reveals to *arjuna* in the *gītā*⁹, “by this, nourish the Gods and let those Gods nourish you in turn. Thus nourishing one another, you shall attain the highest good.” Adī *śankarācārya* describes this highest good as liberation through the attainment of knowledge or of heaven. *Śrī rāmānuja* says that the highest good is *mokṣa* (final liberation). The

⁸ सहयज्ञा प्रजा. सृष्ट्वा पुरोवाच प्रजापति। अनेन प्रसविष्यद्धम् एष वोस्त्वष्ट कामधुक्^{B G 3 10}

⁹ देवान् भावयतानेन ते देवा भावयन्तु व । परस्परं भावयन्त श्रेयं परमवाप्त्यथ॥^{B G 3 11}

mahānārāyaṇopaniṣat also speaks of sacrifice as the means of liberation for the seekers of the highest good

Śrī kṛṣṇa clarifies further in the *bhagavadgītā*¹⁰ that he who enjoys all the objects of desire bestowed by the God without offering them anything in return is but a thief. What happens to such a thief? Regarding this, *āchārya śrī rāmānujam* says in his commentary in the *gītā* commentary, “the purport is that such a person becomes unfit not only for the supreme ends of human endeavor but goes downwards towards purgatory (*naraka*)” In the next verse^{ibid 3/12}, *śrī kṛṣṇa* tells *arjuna*, “pious men who eat the remnants of sacrifices are freed from all sins. But the unholy ones, who cook only for their own sake, incur sin.”

What is the meaning of this word of caution given by the Lord? *Āchārya śrī rāmānujam* clarifies this point in his *gītā* commentary as follows, “but they are evil-minded who acquire for their own selfish use all the things which the Supreme Being, abiding as the Self of *indra* and all the other Deities, has given them for worshipping him, and instead use it for feeding themselves (for their own ends) such persons eat only sin. Turning away from the vision of the Self, they cook (use the materials of the sacrifice) only for being led to *naraka* (hell).”

Thus if the sacrifice has a selfish motive or the objects of desire sought therein is not in conformity with the lawful aims of human existence, no part of it will be acceptable to the Gods who will consequently be deprived of their due share. Thus the performer of the sacrifice will be deemed a thief as stated by *śrī kṛṣṇa*. He will incur sin. The *para-brahman* alone about the fruition of all the rituals of the *vedas* as declared by *śrī kṛṣṇa* in the *gītā*¹¹. If a sacrifice is against the *śāstras* or if it is against *dharma*, it will not please the *parabrahman*.

¹⁰ इष्टान् भोगान् हि वो देवा दास्यन्ते यज्ञभाविता । तै दत्तान् अप्रदायेभ्यो यो भुङ्क्ते स्तेन एव स ॥ BG 3.12

¹¹ सर्वस्य चाह हृदि सन्निविष्टो मत्त स्मृतिर्ज्ञानमपोहन च । वेदैश्च सर्वैः अहमेव वेद्य वेदान्तकृत् वेदविदेव चाहम् BG 15.15

External & Internal Sacrifices:

All *yajñas* can be divided into two broad categories from the conceptual point of view. It is useful to know this for a better understanding of the gradual evolution of the system of *yajñas* in Hindu religion and philosophy. The two broad categories are as follows -

- 1 External Sacrifices
- 2 Internal Sacrifices

External Sacrifices:

External sacrifices manifest themselves in the form of external *karmas* or actions which can be perceived by our outward senses. Such sacrifices are generally the attainment of some object of desire in this world or the next, some benefit for people and living creatures in general, the world of the Manes (*pitrloka*) and the Moon.

External sacrifices directly invoke divine help. It is a tangible mode of worship which most householders can also undertake. Major *yajñas* with the help of qualified priests. The procedures laid down for external sacrifices instill spiritual, mental and physical discipline. Apart from the benefits to the performer of the sacrifice, external sacrifices help to preserve our *sanātana dharma*, our scriptures, and our religion and culture. External sacrifices are known to yield health and ecological benefits to a large number of people participating in such *yajñas*.

There is a growing body of supporting personal and scientific evidence in favour of *yajñas*. Properly performed, external sacrifices are sure to yield the desired results. In external sacrifices more than one person can participate and derive subsidiary benefits. There is a welcome trend in the last fifty years or so to revive the periodic performance of the *yajñas* because of the rediscovery and realization of its material and spiritual benefits.

Internal Sacrifices:

Such sacrifices use no material substances but employ concepts, thought, faculties, emotions, powers, Etc , and the aim of such sacrifices is to attain non-materialistic ends Internal sacrifices are not easily perceived by our outgoing senses because there are almost no external manifestations which are obvious Internal sacrifices aim at the internal purification and perfection, attainment of some internal non-material desire, or attainment of the worlds ranging from that of the Gods (*devaloka*) to that of *hiranyagarbha* (*brahmaloka*) and final liberation

Not only *bṛhadāranyaka*, but *chāndogya īśāvāsya katha auttareya* do emphasize on the knowledge of *brahman* as essential to liberation The transition from the outer *yajña* towards the inner *yajñas* is suggestively described in terms like *hiranyagarbha*

According one of the minor *upanisats* the sacrifice could be performed by the sacrificer within one's own body that has all the necessary articles/ items and functions required by the *yajñas* according to the *śrauta* rite

In a sense, sacrifices using the consecrated fire, oblation and mantras represent external aspects of *yajñas* which have some object of desire in mind *Śrī kṛṣṇa* tells *arjuna* in the *gītā*¹² of various types of sacrifices which are internal in nature He says ^{ibid}, some yogins resort only to the sacrifice related exclusively to the Gods " *Rāmānuja* in his commentary on the *gītā* clarifies that such a sacrifice takes the form of worship of the Gods and the meaning of the Lord's statement is that such *yogins* have steadfast devotion only to this form of sacrifice Further in the same context Lord says, "others offer the Self as sacrifice by the Self itself in the fire of *brahman* " *Ādi śankara* in his commentary elucidates that the offering of the

¹² दैवमेवापरे यज्ञ योगिन पर्युपासते ब्रह्ममावपरे यज्ञेनैवोपजुहति

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Self by the Self in the fire of *brahman* is nothing but the realization of the *brahman* without any limiting adjuncts

Śrī kṛṣṇa tells *arjuna* about other types of sacrifices wherein the sacrifices are conceptual involving no tangible material objects. He speaks of those who offer as oblation like hearing and other senses in the fire of restraint, of others who offer as oblations the sense objects such as sound etc into the fires represented by the corresponding senses, of still others who offer as oblation the function of the senses and the activities of the vital breath into the yoga of the restraint of the mind, and of those who perform sacrifices through sacrifice of wealth, through austerities or yoga, and through scriptural study and acquisition of right knowledge. And there are some of restricted diet who are devoted to the control of the breath, sacrificing the inward breath in the outward breath and vice versa. In all these sacrifices mentioned by the Lord, the effort put in, the self-control exercised, the self mortification or torture undergone, the vows taken, the apprehension, the anxiety, and the suffering experienced during the course of the sacrifice are on the part of the *yajmāna* of the sacrifice alone none else.

The *yajña* is in essence a spiritual practice as it is a form of worship. The *yajmāna* must be competent to perform the *yajña*. There are certain conditions for any type of *yajña* to be successful. One is that the particular deity should be invoked by reciting the appropriate mantras with faith and full knowledge of its deeper meanings. The other is that the *yajmāna* must be internally fit in all respects.

The immediate aim of the inner *yajña* is the perfection of all the faculties of the *yajmāna* who has resolved to perform it. These faculties include the physical aspects of the human body as well as the mental aspects such as intuition, intelligence, foresight, powers of reasoning and discrimination, a range of emotions, passions, attitudes, and ideals. All these may be collectively thought of as parts of

the subtle body of the *yajmāna*. If the *yajmāna* is internally unfit to receive the powers that the invoked deity has resolved to plant in him, the deity will not act and the *yajmāna* will feel no effect whatsoever and the *yajña* will be a failure. On the other hand, if the *yajmāna* is internally fit in all respects, the deity invoked will duly plant the germ of his power which will grow steadily to yield the desired benefit.

The inner *yajña* is essential for preparing the body and the mind and making it fit to receive the powers poured down by the invoked deities. The *taittarīya samhitā* mentions details of several inner *yajñas* like *darśapūrnāmāsa agnistoma*. Etc., which are in the first *kānda*. Once one of these *yajñas* is properly done, the body will become fit to receive the powers or the benefits which the deity can transfer. These inner *yajñas* involve the use of the *rk mantras*, *yajur mantras* or *sāma mantras*. In the inner *yajñas*, all the actions and their effects are directed towards various aspects of the subtle body of the *yajmāna*. In the context, the *yajmāna* is not the human body with its external manifestations and actions but the very self or the soul.

Whatever the mode of the sacrifice, the *yajña* of sacrifice is essentially an act of worship. One may worship the *para brahman* directly or indirectly through other divinities. Provided it is done in accordance with the *śāstras* and is not *adhārmic*, such worship goes to the *para brahman* alone as stated in the *gītā*¹³. The *parabrahman* or the Supreme Being has made His worship very easy, for He has said¹⁴, “Whosoever offers me with true devotion a leaf, a flower, a fruit or even some water, I accept such offering made with devotion by one who is pure of heart”. Out of compassion for human beings, the Supreme Lord has made it so simple to worship Him. He has recommended the use of common, easily available inert material for his worship. He is easily satisfied by this. The Gods are appeased by the

¹³ येप्यन्यदेवता भक्ता यजन्ते श्रद्धयान्विता । तेऽपि मामेव कौन्तेय यजन्त्यविधिपूर्वकम् ॥ BG 9.23

¹⁴ पत्र पुष्प फल तोय यो मे भक्त्या प्रयच्छति । तदहं भक्त्युपहृतम् अश्रामि प्रयतात्मन ॥ BG 9.26

conduct of sacrifices as laid down in our *śāstras*. To seek their divine help, they have to be duly invoke. For this we have to perform the various *yajñas* as per the prescribed Rules and Procedures.

Both the external and internal sacrifices are essential for the material and spiritual well being of mankind as well the rest of the living being. They are complementary to each other and not mutually exclusive. Each type of sacrifice, in any case, requires a different specific approach. The degree of difficulty also varies. For all round growth, development and prosperity both forms of sacrifice have been enjoined in our Scriptures and other Sacred Texts. We cannot afford to neglect either.

The constituents of a yajña:

Introduction:

The resolve to perform a *yajña* and its subsequent performance depends upon the following essential concepts.

- *Bhāvanā* It is the urge which arises in the prospective sacrifices to perform a certain *yajña* for a given purpose. It is the motivational force which leads to the undertaking of the *yajña*. This *bhāvanā* arises due to one or more reasons and are very complex and esoteric. It may be due to some identifiable reason such as one's good *karmas* or the benediction of one's *āchārya*. It may be due to a reason beyond the understanding of human beings such as the *nirhetuka-katāksa* or the grace of God which has been showered upon us for no specific reason we can think of. Nor can we assign any matching quality in us or any appropriate *karma* done by us as the probable cause for this grace of God.
- *Svādhyaya* This implies self study or inquiry and self reflection. It is a form of *yoga*. Every *yajña* should be performed as ordained in the scriptures if it is

to achieve its stated purpose Only if the *yajamāna* knows all about the various aspects of the intended *yajña*, will he be able to make himself competent to perform the *yajña* and to perform the external actions correctly Hence, he must enquire into and learn all about aim, scope and procedures of the proposed *yajña*

- *Karma* These are the rites and rituals which must be performed in the correct order and in the manner prescribed
- *Tyāga* This represents the offerings to be given in the *yajña*
- *Devatās* These are the Deities or divine powers who are to be propitiated and whose help is to be invoked
- *Phala* This is the end result of the *yajña* as given in the Scriptures

The nature of karmas or actions in sacrificial rites:

The *karmas* of actions involved in all rites and rituals can be divided into two categories for a better understanding namely *artha-karmas* and *guna-karmas* *Artha-karmas* are the principal action connected with the purpose of the *yajña* while the *guna-karmas* are subsidiary rites associated with the principal rite

Artha karma:

Artha-karmas are of three types as follows -

- *Nitya-karmas* are those karmas (or rituals) which have to be performed daily by *hindus* The *hindu śāstras* say that non performance of *nitya-karma* leads to sin Some examples are *snāna*, *sandhyāvandanam*, *aupāsanam*, *agnihotram deva-rsi-pitr tarpanam* and *brahma-yajña*
- *Naimittika-karmas* are the rites to be performed on special occasions by the *grhastha* Some examples are *garbhādhāna* (conception), *jātakarma* (at birth), *nāmakaranam* (naming ceremony), *annaprāśana* (first feeding), *caula*

(tonsure), *vivāha* (marriage), and *antyeṣṭi* (death) The *naumittika-karmas* are also obligatory as per the *śāstras*

- *Kāmya-karmas* are those actions or *karmas* (or rituals) which are performed with a specific objective in view Unlike *nitya-karmas*, these rituals are not required by the *śāstras* to be performed on a daily or regular basis They are not obligatory but optional A *kāmya-karma* is performed with a specific desire in mind Examples of some *kāmya-karmas* are *putrakāmeṣṭi*, *jyōtistoma*, *agnistoma*, *agnicayana*, and *soma-yajña*

Guna karmas:

Guna karmas, which are subsidiary and form components of *artha karmas*, are intended for preparation and purification *prāyaścitta* or expiation rites are also part of the subsidiary rites/ *guna karmas*

Tyāga:

Tyāga is associated with offering There are three kinds of offerings

- Yāga (sacrifice)
- Dāna (giving)
- Homa (offering)

Of these the word *yāga* refers to the principal rite and the other two are associated with subsidiary rites *Dāna* is the act of transferring one's complete rights over what is given to the recipient of the *dāna* *Dāna* is not done in anticipation of anything The results are invisible and accrue only if there is no expectation

Homa is the act of offering *havis* or oblations to *agni* This involves *tyāga* of what is being offered with the *samkalpa* or thought contained in the words “*na mama*”, meaning that which is being offered is no more mine, it belongs to the *deva* (or the *pitṛ* as the case may be) to whom the offering is being made There is no

expectation in the act itself but the result will come to the *yajamāna* or sacrifice as part of the overall results of the entire sacrifice. *Homa* is central to any *agnikārya* or sacrifice performed in *agni* and this term has become almost synonymous with the word *yāga* itself though *homa* is a component of *yāga*. In some kinds of *yajnya* which do not involve *agnikārya*, oblations are offered as *dāna*.

Devas:

The term *deva* denotes the Deities who are invoked in the sacrifice. *Devas* accept the *havis* offered in a sacrifice and bestow the results sought. Along with the results, the sacrifice gets the grace of the Gods. *Devas* are *mantra-baddha* which means that they are bound to bestow the results of a sacrifice when invoked in the prescribed manner. Thus a sacrifice performed according to the *śāstras* is bound to yield the prescribed results.

Havis offered in a sacrifice constitute the food for *devas*. Nourished by the *havis* offered in worship or sacrifices, the *devas* grow and prosper on *havis* and in turn, help to bring about the well-being of men (through rain and so on).

The participants of the yajña:

The yajamāna or the sacrifice:

The *yajamāna* is the most important person in the *yajña*. He is the pivot around which all the rituals are performed. The decision to undertake the *yajña* is his. He is the one who employs the priests to conduct the sacrifice. He meets all the expenditure. The fruits of the *yāga* accrue to him alone. The etymological meaning of the word *yajamāna* is “one who is the performer of a sacrifice”. The *ṛtviks* or the priests are only to assist the *yajamāna* in performing the *yāga*. It should be noted that through many of the physical actions connected with the rituals are performed by

the priests, since they receive their dakshina or emoluments, the way is clear for the *yajamāna* to attain the fruits of the sacrifice

A *grhastha* (married man) belonging to the first three *varnas* based on *brāhmaṇa*, *ksatriya*, and *vaiśya* are entitle to maintain the *vedic* fires and perform sacrifices According to the *śāstras*, the *vedic* fire could be established by the householder as soon as he is married But due to various constraints such as expenses involved, the need to travel from one place to the other Etc , these *vedic* fires could not be maintained in many instances Hence, it became the practice to set up these fires in one's middle age when there were greater chances of remaining in one place Once established, it was obligatory to maintain the fires throughout one's life If extinguished for some reason, the householder had to ceremonially rekindle them The wife of the *yajamāna* is called the *patnī* She too has an important role to play in the *vedic* sacrifices

Rtvik or priests:

The *rtvik* or priests are crucial to the planning and erection of the required facilities and for the proper conduct of the *yāga* It is, of course, the *yajamāna*'s privilege to choose the priests They specify all the material, utensils, implements and material needed for the sacrifice They are the guardians of the ancient rules and producers laid down in concerned text and it is their responsibility to ensure that there is no deviation so that no *dosa* or defect in the rituals occurs, which may negate the sacrifice entirely or yield poor or bad result

A *rtvik* should preferably be on the younger side because the *yāga* rituals are elaborate, taxing and spread over many days¹⁵ There is, however, no bar on selecting older persons if all the qualities are met A *rtvik* should be well-versed in the *vedas* having acquired that knowledge by attending the *gurukula* (traditional

¹⁵ अर्थोऽस्मर्थो विद्वान्यजेत

school) He should come from a line of traditional priests with a good lineage. He should be leading a pure and spiritual life as described in the *smṛti* texts. He should have no physical deformities or disabilities.

The various duties connected with any *yoga* are divided between the priests according to an ancient system which remains unchanged even today. The main priests are divided into four categories, each representing one of the four *vedas* as noted against each as follows:

- The *ṛigveda* - *hotā*
- The *yajurveda* - *adhvaryu*
- The *sāmaveda* - *udgātr*
- The *atharvaveda* - *brahma*

Each of the *vedas* is so enormous that each category contains four priests to share the task. Thus there are a maximum of sixteen priests as follows:

- 1 The *hotā* group consists of (a) *hotā* (b) *sautrāvaruna* (c) *acchāvāka* (d) *avastut*
- 2 The *adhvaryu* group consists of (a) *adhvaryu* (b) *pratiprasthāta* (c) *nesta* (d) *unneta*
- 3 The *udgātr* Group consists of (a) *udgāta* (b) *prastota* (c) *pratiharta* (d) *subrahmanya*
- 4 The *brahma* Group comprises of (a) *brahma* (b) *brahmanacchāmsi* (d) *agnīdhra* (d) *pota*

In each group, the first named is the main priest and the other three are his assistants. These assistants are called *dvitīyī* or *ardhī*, *trītyī* and *pādī*. The level of their responsibilities, the scope of their duties as well as their fees are in declining order. For instance, the *dvitīyīs* are paid half, the *trītyīs* one-third, and the *pādīs* one-

fourth of the fees paid to the chief priests known as the *mahartvijas*. The number of priests in a given sacrifice depends upon the extent of the tasks involved. It is in the *soma yāgas* that all sixteen priests take an active part.

The head priest of the *brahma* group i.e. the *brahma*, usually the most learned, is the master of ceremonies and the supervisor of the entire *yāgas*. However, the key priest of a major *yāga* like the *soma yāga* is the *adhvaryu* because he carries out certain most important tasks as follows:

1. Selection, planning and layout of the sacrificial ground
2. Marking with exact measurement for construction and erection of various facilities required as per the *śāstras*
3. Supervises the construction of all facilities like structures, platforms, plinths, enclosures etc.
4. Procurement of all vessels, implements, instrument, *dravya* and other material to be used in the sacrifice.

The success of any *yāga* depends upon ensuring the right set-up at the very start. Therefore, the knowledge and competency of the *adhvaryu* is most critical.

Agni:

Agni or fire is the most important constituent of *vedic yāgas*. Lord *agni* is the Presiding Deity of the elemental fire. Rgveda¹⁶ describes *agni* as the presiding priest, God of *yāga*, *rtvik*, and the one who brings the Gods to the sacrifice. This is again confirmed in the *rgveda*¹⁷ which says “*sa devan iha vaksati*” meaning ‘he brings the Gods here’. He is the bearer of the *havis* or oblation to the various Deities. He is therefore also called by the name of ‘*havyavat*’ or ‘the one who

¹⁶ अग्निमीळे पुरोहित यज्ञस्य देवमृत्विजम् । होतारं रजिधातमम् ॥ R V 1/1/1

¹⁷ अग्निं पूर्वैर्भितृभिर्भिरिड्यो नूतनेरुत । स देवो एह वक्षति ॥ R V 1/1/2

carries the *havis*' The *rgveda*¹⁸ declares, "O *agni*, that *yāga* which is surrounded on all sides by Thee, that alone reaches the God " *Agni* bestows auspicious happiness¹⁹ and is the luminous guardian of the truth Since *agni* is the elemental source of light and energy, it is sometimes identified with the *para- brahman* That is why Lord *agni* is also referred to as '*jātavedas*' or 'One who knows everything immediately upon manifestation'

The *mundakopanisat*²⁰ says, "When the sacrificial fire has been well-kindled and the flames begin to move, then pour the oblations between the two portions of the fire He, who performs the sacrifice by offering the oblations into these radiant flames at the appropriate time, these oblations like the rays of the sun, verily takes him to the place where the one Lord of the Gods resides "

There are two reasons why the consecrated sacrificial fire is pivotal to the performance of a sacrifice according to the *hindu śāstras* One is because Lord *agni* is the most important part of the vedic sacrifice being the deity who supervises over the elemental fire The *mahānārāyanopanisat*²¹ declares that *agni* is born on the days of the sacrifices as the protector of men in general and of those who offer sacrifices, in particular The *mahānārāyanopanisat*²² says that the great sacrificial fires are three-fold knowledge leading to Godhood and that the sacrificial fires are the supreme means of liberation

¹⁸ अग्ने य यज्ञमध्वर विश्वत परिभूरसि । स इद्देवेषु गच्छति ॥ R V 1/1/4

¹⁹ यदङ्ग दाशुषे त्वमग्ने भद्र करिष्यमि । तवेत् तत् मत्स्यमङ्गिर ॥ R V 1/1/6

²⁰ यदा लेलायते ह्यर्चि समिद्धे हव्यवाहने तदाज्यभागवन्तरेणाहुती प्रतिपादयेत्^{M U 1 22} एतेषु यश्चरते भ्राजमानेषु यथाकालं चाहुतयो

ह्याददायन् । त नयन्त्येता सूर्यस्य रश्मयो यत्र देवाना पतिरेकोधिवास^{M U 1 23}

²¹ त्वमग्नेद्युभि शुचि^{Ma U 76/1}

²² यज्ञे सर्वं प्रतिष्ठितं तस्माद्यज्ञं परमं वदन्ति^{Ma U 79/9}

There are three types of *agni* collectively called the *tretāgni* as follows -

- *Gārhapatya* meaning that which belongs to the *grhapati* or the owner of the house
- *daksina*
- *Āhavanīya*

Gārhapatya is the origin of the other two, and all the three are worshiped regularly

Agnis are also classified into two types on the basis of mobility as under -

- *Viharaneeyā* which can be moved from one spot to the other
- *upastheya* which are fixed and cannot be moved

Each of these two categories contains 8 different types of fires which are positioned in different places in the sacrificial layout as follows

The *viharaneeyā agnis* are placed next to *rtviks* as follows -

- 1 *Vibhurasī pravāha* is placed next to the *agnīdhra*
- 2 *Vahnirasī havyavāhana* is placed next to the *hota*
- 3 *Śvātrosī praceta* is placed next to the *maitra-varuna* (the place where these *devatas* are invoked)
- 4 *Stuthosī viśwaveda* is kept next *brahmanacchāmsī*
- 5 *Usigaisikavi* is placed next to the *pota*
- 6 *Anghārsīyambārī* kept near the *nesta*
- 7 *Avāsyurasīduvasvān*, near the *rtvik* called *acchāvāka*
- 8 *Śundhyurasī mārjalya* is kept near the *rtvik* called *mārjala* (the one who does *māṛjana* or purification and consecration)

The *upasheyas* are stationed at the following places -

- 1 *Samrādasī kṛśānu* is located at the secondary altar in the north This is the *āhavanīya agni*
- 2 *Parisadyosī pavamāna* is located at *dhruva-sthālī*
- 3 *Pratakvāsī nabhasvān* is located at the *catvala-sthāna*
- 4 *Asammrstosī havyasūda* is located at samitra (the place of *paśu*)
- 5 *rtadhmāsī suvardhama* is located with the *brahma* of the sacrifice
- 6 *Ajasyekapāt* is located at the *sukhasala* This is the *gārhapatya*
- 7 *Ahrasibudhniya* is located with the *yajamāna*

The Oblations:

Then there are the oblations to be offered into the consecrated fire What are these? The *mahānārāyanopaniṣat*²³ speaks of clarified butter as the oblation which will invoke the presence of the Gods and delight them The *mahānārāyanopaniṣat* also mentions about the fuel for the consecrated fire in the form of unbroken currents of clarified butter which kindle the splendor of the holy fire The *mahānārāyanopaniṣat* further says, “Kindling the consecrated fire with chips or small sticks of wood, may I attain both the worlds Having attained the prosperity of this world and the next, I shall cross over death ”

Dravya depends on the nature of rite The essential principle is to perform *anna-homa* which means that the offering should be in the form of acceptable nourishments In general the Vedic offerings consisted of one or more of the following ingredients as enjoined in the texts

- Rice
- Corn
- Specific *samidhas*
- Blades of grass

²³ घृत मिमिक्षिरे घृतमस्य योनि

घृतमुवस्यधाम Ma U 12/7

- Milk
- Other cereals
- Curd
- Barely
- Fruits
- Various powders
- Vegetables and flowers

Phala:

Phala literally means ‘the fruit or fruits’ The *phala* of any sacrifice is bound to accrue provided the sacrifice is performed in accordance with the *śāstras*. It may accrue in this world in the present life of the sacrifice or it may materialize in the after-life in this world or some other world such as heaven.

The overall results of a sacrifice are a combination of the fruits of each of the subsidiary rites and the fruit of the main rite. Each rite creates a unique result which may be perceptible or invisible. Visible results are called *pratyaksa* while invisible results are called *alaukika*.

The vedī:

Vedī is the term for the “sacrificial altar” in *vedic* terminology. Such altars were built either as an elevated or an excavated plot of ground, generally strewn with *darbha* grass on which sacrificial utensils and implements were kept. The *vedī* is shaped within a given rectangular area with its northern and southern sides being concave. *Vedic* altars are described in the *vedic* texts dealing with *kalpa*, notably the *śathapatha brāhmaṇa*. The *śulbha sūtras* say that the entire *ṛgveda* corresponds to an altar of *mantras*.

The exact measurements and the shape of a *vedī* would vary according to the type of *yajña* being performed since different measurements are given for different *yajñas* in the concerned texts. The units of measurements are always relative being equal to the either the *yajamāna* height of the of the particular *yajña* or the distance from his elbow to the tips of the fingers or the length of the normal step. For instant, the dimensions of the *vedī* and the *yāgashala* depend upon the height of the *yajamāna*. In the *darśapūrnamāsa yāga*, the length of the *vedī* is equal to his height.

The *mahavedī* is the great or entire altar. The *uttaravedī* is the northern altar made for the sacred fire *agniyayatana*. The *dhīshmya* is the subordinate or side-altar, generally a heap of earth covered with sand on which the fire is located. The *drona* is an altar shaped like a trough ^{shulbha Sūtras 3.216}. The *adhvaradhīshmya* is a second altar at the *somayāga*.

Cayana or agnicayana:

Closely linked with the setting up of the *vedī* is the ritual of piling up the bricks for the fire-altar in the *somayāgas*. This is called *cayana* or *agnicayana*. The altar is built up with five layers of bricks. It may have several shapes such as *suparna* or the eagle, *śyena* or the hawk, and *drona* or a trough. The construction of the fire-altar is the most complicated part of the *śrauta* Sacrifices. Almost one third of the *śatapathabrāhmaṇa* where it is associated with the *ṛsi śandilya* is devoted to its exposition. *Agnicayana* probably began as an independent rite, which was later incorporated into the system of soma sacrifices. Although it is not obligatory at every soma sacrifice, it is always a part of one.

One of the unique features of the *Soma yāga* is that the *uttaravedī* is constructed by piling up five layers of fired clay brick in the form of a *śyena* (a bird of prey like a hawk). Built into this construction are the 'heads' of a man, a horse, a bull, a ram, and a he-goat, all of which can be made of gold or clay. After the

cayana ceremony which is performed with various offerings, the elaborate rituals of the *soma* sacrifice begin. The *yajamāna* who has performed *agnicayana* has to observe certain special vows for a year, with variations if he performs it more than once. The duration of the ritual, and the distribution of the rites over particular days, is not clear from the classical manuals, although some rites may have been extended over a year. It obviously entailed a lot of expenditure.

The yāgayuddhas, instruments & implements:

They *yāgayuddhas* or instruments and implements used in *vedic yāgas* are as many as forty three in numbers. Some of the major ones, commonly, used are described here as follows:

- 1 *Agnihotrahavani* It is a large ladle made of *vaikankata* wood (flacourtia spadia) used for pouring oblations of milk into the *gārhapatya* fire.
- 2 *Ajyāsthali* It is a bronze vessel for storing *ājya* or ghee.
- 3 *Anvāharyasthālī* The food that is distributed amongst the priests after the main sacrifice has been completed is cooked in a big metal vessel on the *dakṣiṇāgni* which is also called *anvāharyapacana*.
- 4 *Aranis* The *aranis* consist of two pieces of wood which are used to generate a fire by vigorously rubbing one against the other. Due to friction sufficient heat is produced to cause a fire. The upper piece is named *uttararami* as shaped like a round pestle. The lower piece has a slot into which the upper piece can be inserted easily.
- 5 *Camasa* Soma juice is kept in these deep wooden bowls which have short handles.

- 6 *Daśapavitra and dronakalatha* The former is a small cloth sieve used to strain the soma juice while the latter is a wooden vessel into which the strained juice is collected
- 7 *Dohana* It is the vessel in which milk is collected during milking
- 8 *Drshad and upala* These are two grinding stones used to pound grains for preparing the *purodāsha* (rice cakes) The former, which is the lower stone, is flat while the latter, which is the upper *grinding* stone, is cylindrical
- 9 *ldāpātra and dārupātra* The former is an oblong shaped vessel made of *aśvattha* wood It is used to retain the remnants of *havis* after offering The latter is also a similar vessel but used to store the *purodāśa* and *caru* (porridge) As the two vessels look alike, some distinguishing marks are made for easy identification
- 10 *Juhā and upabhṛt* These are wooden spoons similar to the *agnihotrāhavanī* but smaller in size
- 11 *Kapālās* They are small troughs square-shaped made of burnt clay which are used for cooking the *purodāśa* cakes
- 12 *Krsnājina* It is the deer skin on which the *drshad asad upala* are placed before pounding the rice-grains
- 13 *Madantī* It is the vessel for heating water to cook the *purodāśa* cakes
- 14 *Musala* This is a pestle made of *khadira* wood (acacia catechu) and used for any pounding
- 15 *Pranīta pranayana* This is a long rectangular-shaped wooden vessel made of *aśvattha* wood used by the *adhvaryu* priest to carry the holy water

16 *Sānnayya tāpanī* These are two bronze vessels in which the milk collected in the morning and in the evening are heated mixed together

17 *Sruk* and *sruva* These are small wooden spoons for offering *ājya* or clarified butter

18 *Yoktra* It is a rope made from the *mauñjī* grass straw which is used as a belt

19 *Yūpa* It is the octagonal-shaped wooden post to which the animal to be immolated is tied

Yajña dravyas & the pātras:

Agnikārya forms the core of a sacrifice. It includes purification rites and the *homas*. The ingredients used in *yajña* are called *dravya*. For performing any *agnikārya* the following are required -

- *Sruk* and *sruva* which are wooden spoons/ladles used for making offerings into the fire
- *Idhma* which is wooden pieces/sticks called *samidhas* used as fuel in the sacrifice
- *Pātras* which are large plates or bowls containing various ingredients

The rituals can be conducted smoothly without unwarranted delays if all the materials, vessels, instruments are readily available at hand in the order in which they are required. A *pātra* is a plate or a bowl in which, depending upon its size, certain articles can be conveniently arranged beforehand. Three kinds of *pātras* are generally used as follows

- The *prokṣinī* which is used for sprinkling for purification

- The *ājya* which is used to hold the clarified butter
- The *pūrnāpātra* which literally means “complete plate” is used keeping all other ingredients needed for completion of the rite

Catuspatra & satpatra:

Depending upon on the *dravya* used according to each specific rite to be performed there are two major classes of *pātras*. One is the *prayoga-catuspātra* containing four ingredients and the other is the *satpātra* using six ingredients. *Satpātra* involves the usage all the six *dravyas* mentioned above. *catuspātra* does not involve *idhma* and *purnapātra*. Most of the *prayogas*, *nitya* or otherwise involve *satpātra prayoga* which means ‘the usage of the plate with seven ingredients’

Some of the sacrifices involve more than six primary ingredients. For instance marriage ritual in *āpastamba sampradāya* is called *dasa pātra* (involving 10 ingredients). Major *yajñas* like the *vājapeva* of the *somayāga* group use many more. However all of them come under the classification of *satpātra* only and the additional *dravyas* are included as one of the six standard items.

Soma in the vedas:

Introduction:

The literal meaning of the term *soma* in *sanskrtam* is “juice”. *Soma* is widely referred to in the *rgveda*. In fact the ninth *mandala* of *rgveda* consisting of 114 *sūktas* (hymns) is entirely devoted to *soma pavamāna* (purified *soma*). It is described as being the juice extracted from the stalks of a certain plant and then purified for offering to the Gods at sacrifices. The *sanskrtam* word *sav* which means “to press” gives us the clue that *soma* drink was prepared by pressing the stalks of a plant.

It is important to note that in *vedic* tradition, both the *soma* plant and the juice extracted thereof are considered as a single divine entity and with regard to this conscious visualisation, both are synonymous. Further, the God is both the plant and the drink and vice-versa. Thus in all references, rituals, and thoughts, all three are the same.

The Characteristics of Soma:

The Soma Plant:

There has been much speculation as to the exact nature of the original *soma* plant in botanical terms and its location or habitat. The *rgveda*²⁴ mentions that the *soma* plant is to be found in the hills. However, the *suśruta samhitā* states that while some varieties of *soma* are to be found growing in the hills and mountains of ancient India, like the Himalayas, *arbuda*, *sahya*, *mahendra*, *malya*, *śree parvata*, *devagiri*, *devasaha*, *pariyaatra* and *vindhva*, a few other varieties are known to grow in the aquatic habitats around *devasunda* Lake, the *sindhu* River and the little *manas* lake in Kashmir. The famous *āyurvedic* scholar *suśruta* wrote that the best *soma* is found in the upper Indus and Kashmir region.

Our belief is that much before mortals, the *soma* drink was first prepared, stored and distributed by the *gandharvas*. The *rgveda*²⁵ links certain regions such as *sushoma*, *arjikiya* and others with *soma*. Another location mentioned in the *rgveda* is *sharyanavat* which was possibly the name of a pond or lake on the banks of which *soma* could be found.

²⁴ परि सुवानो गिरिष्ठा पवित्रे सोमो अक्षा । मर्देषु मर्दधा असि ॥ R V 9/18/1

²⁵ सुषोमे शर्यणावत्याजीके पस्त्यावति । ययुर्निचक्रया नर ॥ अय ते मानुषे जने सोम पूरुषु सूयते । तस्येहि प्र द्रवा पिब ॥ अय ते शर्यणावति सुषोमायामधि प्रिय । आर्जीकीये मदन्तम ॥ R V 8/7/29 8:64 10&11

In the late *vedic* period substitutes for *soma* came to be used apparently because the original plant could not be obtained probably because it had become very rare or even extinct. It is also possible that knowledge regarding the original plant and its source was lost in due course. It has recently been identified with the fly agaric mushroom *amanita muscaria*, used in Siberian tribal rituals. But there is no direct evidence in the *vedas* that the *soma* plant was a mushroom. The *rgveda* mentions only of the 'soma stalk'²⁶. Besides that, the *rgveda* clearly states that the juice is to be extracted by pressing and pounding which seems relevant only in the case of fibrous or hard plant material (twigs, roots, and seed). Present day research has focused on twenty different plants as likely candidates for the original *soma* plant.

In due course of time, when all knowledge of the original plant had been lost altogether, our rituals began to offer expiatory prayers apologizing to the Gods for the use of a substitute plant because *soma* had become unavailable. However, the important thing to bear in mind is that when offering anything to the Gods, true faith and devotion are far more important than the absolute authenticity of any specific material whether ordinary or rare and exotic. Wherever it may be, we can safely follow the prevailing traditions as advised by our *āchārya* provided we do so with dull faith and devotion. Sri *krīṣṇā parāmātmā* has declared in the *bhagavadgītā* 9/26, "Whosoever offers me with true devotion a leaf, a flower, a fruit or even some water, I accept such offerings made with devotion by one who is pure of heart".

²⁶ दिवो यः स्कम्भो धरुणः स्वाततः आपूर्णो अशुः पर्येति विश्वतः । सेमे मही रोदमी यक्षदावृता समीचीने दाधार समिपः कविः ॥
अरावीदशुः सचमान ऊर्मिणा देवाव्यः मनुषेः पिबन्ति त्वचम् । दधाति गर्भमदितेरुपस्थः आ येन तोकः च तनयः च धामहे ॥ R V 9/74 2
&5

The colour of soma:

The ninth *mandala* of the *rgveda* contains a number of references to the colour of *soma*. *Soma* has been described as possessing a brown hue²⁷ or a tawny (orange brown) shade²⁸. It has been described as ever green and green hued²⁹. Its colour has also been described as golden hued³⁰. Elsewhere, the soma juice has been called bright red³¹.

It is quite possible that these variations in colour may have been due to the specific variety of the soma plant available and the process of extraction and stage of storage. Whatever the colour, there is no doubt that the juice radiated feelings of power, potency, divinity. The *rgveda*³² describes it as 'bright and shining'.

The Preparation of soma:

The *rgveda*³³ clearly mentions that the soma juice is extracted by pressing. The pressing is to be done by stones and this requires skill as mentioned in the

²⁶ पत्रम् पुष्पम् फलम् तोयम् । यो मे भक्त्या प्रयच्छति

तदहम् भक्त्युपहतम् अश्नामि प्रयतात्मन ॥ B G 9/26

²⁷ बभ्रवेनु स्वतवसे अरुणाय दिविस्पृशे । सोमाय गाथमर्चत ॥ अमित्र विचर्षणि परस्वसोम श गवे देवेभ्योऽनुकामकृत् ॥ R V 11/4 & 7

²⁸ बर्हि प्राचीनमोजस पवमान स्तृणन् हरि देवेषु ईयते R V 5/4

²⁹ वनस्पति पवमान मध्वा समङ्घि धारय । सहस्रवल्श हरित भ्राजमान हिरण्ययम् ॥ R V 5/10

³⁰ वनस्पति पवमान मध्वा समङ्घि धारय । सहस्रवल्श हरित भ्राजमान हिरण्ययम् ॥ R V 5/10

³¹ पुनान कलशेष्व वस्त्राण्यरुषो हरि परिगव्यान्यव्यत R V 8/6

³² जनयत्रोचना दिवो जनयन्नप्सु मूर्यम् । वसानो गा अपो हरि ॥ पवमानस्य ते रमो मदो राजन्नदुच्छ्रुत । वि वारमव्यमर्पति ॥ R V 9 42 1 and 9 61 17

³³ एष प्रत्नेन जन्मना देवो देवेभ्य सुत । हरि पवित्रे अर्पति ॥ परि प्रिया दिव कविर्वयासि नस्योर्हित । सुवानो याति कविक्रतु

॥ प्र ते सोतार ओण्यो रस मदाय घृष्ट्वये । सर्गो न तक्त्येतश ॥ R V 9/3/9/ 9/9/1 & 9/16/1

*rgveda*³⁴ Under pressure, the sap is aid to come out in copious quantities like “a flood”³⁵

Soma is referred to as *soma pai vamāna* (*soma* purified) in the ninth *mandala* Two sukta of the *rgveda*³⁶ mention the use of straining cloth, no doubt for filtration and purification The use of fleece is mentioned in³⁷ while a woolen straining cloth is mentioned in³⁸ The use of a sieve is mentioned in several places in the *rgveda*³⁹ which indicates that the process of preparation of the *soma* juice involved removal of sediment and other impurities by filtration and consequent purification

The benefits of soma:

There is no doubt about the general and most outstanding benefit conferred by the *soma* juice as stated in the *rgveda*⁴⁰

We have drunk *soma* and attained immortality, we have ourselves seen that light which was discovered by the Gods Now then what harm can the evil intentions of our enemies do to us? Of what avail is the deception of mortals, O immortal one?

The implication of this verse is that *soma* confers excellent health and the power, both physical as well as mental, to effectively counter the evil designs of the enemies

³⁴ वृषाण वृषभिर्यत सुन्वन्ति सोममद्रिभिः । दुहन्ति शक्मना पयः ॥ R V 9/34/3

³⁵ प्र ते सोतार ओण्यो रसं मदाय घृष्वये । सर्गो न तक्त्येतशः ॥ R V 9/16/1

³⁶ एष देवो अमर्त्यः पर्णवीरिव दीयति । अभि द्रोणान्यासदम् ॥ एष प्रत्नेन जन्मना देवो देवेभ्यः सुतः । हरिः पवित्रे अर्षति ॥ R V 9/3/1 & 9/3/9

³⁷ सोमः पुनानो अर्षति सहस्रधारो अत्यविः । वायोरिन्द्रस्य निष्कृतम् ॥ R V 9/13/1

³⁸ अत्या हियाना न हेतुभिरसृग् वाजसातये । वि वारमव्यमाशवः ॥ R V 9/13/6

³⁹ कृत्वा दक्षस्य रथ्यमपो वमानमन्धमा । गोपामण्वेषु मश्रिमः ॥ अनप्तमप्यु दुष्टर सोमः पवित्र आ सृजः । पुनीहीन्द्राय पातवे ॥ प्र

पुनानस्य चेतसा सोमः पवित्रे अर्षति । कृत्वा मधस्थमासदत् ॥ R V 9/16/2 to 4

⁴⁰ अपामः सोमममृता अभूमागन्म ज्योतिरविदाम देवान् । किं नूनमस्मान्कृणवदराति किमु धूर्तिरमृत मर्त्यस्य ॥ R V 8 48 3

Soma confers prosperity:

There are many references which clearly mention that *soma* confers great wealth, treasures and prosperity. Some examples given in the *rgveda* are as follows

“O India, O *soma*, send us now great opulence from every side, pour on us treasures a thousand fold ” ⁴¹

‘Since you are purified, give us the strength of a hero and riches to those who worship you ” ⁴²

Indra! O *soma!* Being purified, bring to us riches doubly piled (Bring us) wealth, O Mighty India which are worthy of the praises (tendered by us) ⁴³

Soma confers the ability to fight the enemies:

Soma has the capacity to bring down the enemy’s might, his vigorous strength and vital power, whether he is far or near according to the *rgveda* ⁴⁴ *Soma* can drive away our enemies ⁴⁵ and give us victory in war ⁴⁶

Soma’s ability to transform us for the good:

There are a number of verses in the ninth *mandala*, hymn four of the *rgveda* which mention of the various ennobling qualities of *soma* which makes us better

⁴¹ शूरग्राम सर्ववीर सहावाञ्जेता पवस्व सनिता धनानि । तिग्मायुध क्षिप्रधन्वा समत्त्वषाळह साह्वान्पृतनासु शत्रून् ॥
R V 9/90/3

⁴² स न पुनान आ भर रवि मतोत्रे मुवीर्यम् । जरितुर्वर्धया गिर ॥ R V 9/40/5

⁴³ पुनान इन्द्रवा भर सोम द्विर्वहस रयिम् । वृषन्निन्दो न उक्थ्यम् ॥ R V 9/40/6

⁴⁴ नि शत्रो सोम वृण्य नि शुष्म नि वयस्तिर । दूरे वा सतो अन्ति वा ॥ R V 9/19/7

⁴⁵ मघोन आ पवस्व नो जहि विश्वा अप द्विष । इन्दो सखायमा विश ॥ R V 9/8/7

⁴⁶ वृष्टि दिव परि स्रव द्युम्न पृथिव्या अधि । सहो न सोम पृतसु धा ॥ R V 9/8/8

than what we are, and which confers number of other aspect such riches, the strength to uphold the law, victory in battle, general prosperity and the wealth of cattle & horses

May we gain skill, strength and mental power O, *soma*! Drive away our foe and make us better than we are Give us our place under the sun through your powers of the mind and other form of help, and make us better than what we are *Soma* possessor's of weapons! Pour on us streams of riches doubly great, and make us better than what we are one victorious unsubdued in battle pour forth wealth to us, and make us better than what we are, by worship, *pavāmana*! Men have strengthened thee to support the law Make thou us better than what are

Allegorical resources to soma:

In the ninth *mandala* of *rgveda*, *soma* has been compared to many forms of life and things that symbolise its special qualities *Soma* has been compared to animals such a strong bull, to a most splendid specimen of cattle, to a war horse, and to a bird upon the wings *Soma* is like a tree whose praise never fails to yield heavenly milk amidst our hymns *Soma* is regarded as a God in its own right *Soma* has been compared to a warrior setting forth with heroes to win many boons and to a fast car *Soma* is looked upon as the friend of the King of the Gods, *indra* and as the faithful friend of mortals *Soma* is seen as the Lord of the mind In fact, *soma* is considered the very support of heaven *Soma* is regarded as the *prajāpati* The sound of *soma* trickling through the sieve is compared to that falling rain and flashes of lightning across the sky

The Qualities of Soma:

The ninth *mandala* of *rgveda* mentions many desirable qualities of *soma* some which are given below as examples

PFD
891.2
P12/KAR

Soma is the destroyer of fiends, the friend of all men *soma* confers bliss 'soma gives us kinship with the Gods *Soma* is considered the food of the Gods in many hymns/verses of the ninth *mandala* of *rgveda*⁴⁷ *Soma* is urged to flow onwards to the banquet of the Gods *Soma* is regarded as fit for the feast and service of the Gods The sages call upon *indra* to drink the *soma* juice *soma* goes to *indra*, *vāyu* and the *aśvins* with the gladdening juice which gives them joy *Soma* goes to *Indra Vāyu vishnu* and the *maruts* All Deities of one accord come to drink of *Soma*

References to the soma sacrifice:

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There are many references to the soma sacrifice in the *vedas* which confirms the fact that the *somayāga* is one of the oldest forms of *vedic* sacrifices The *rgveda*⁴⁸ says the three beautiful Goddesses *saraswati*, *bhārathi*, and *ilā* will attend the *pavamāna* (purified *soma* juice) Sacrifice The *rgveda* invites all the Gods to consecration rites of *pavamāna* The *rgveda*⁴⁹ says that the *somas* adorn themselves with milk even as Kings on whom eulogies are heaped and that with the seven priests the sacrifice is performed

Soma in hindu mythology:

In art, the *soma deva* was depicted as a bull or bird, and sometimes as an embryo, but rarely as an adult human In Hinduism, the God *soma* evolved into a lunar deity, and became associated with the world of the moon The moon is the cup from which the gods drink *soma*, and so *soma* became identified with the moon god *candra* A waxing moon meant *soma* was recreating himself, ready to be drunk

⁴⁷ अलाय्यस्य परशुर्ननाश तमा परस्वदेवसोम आखु चिदेव देवसोम य पावमानीरध्येस्तृषिभि सम्भृत रसम्। सर्व स पूतमश्नाति स्वदित

मातरिश्चन पावमानीर्यो अध्येस्तृषिभि सम्भृत रसम्॥ तस्मे सरस्वती दुहे क्षीर क्षिपर्मधूदकम्॥ R V 17/30 31 7 32

⁴⁸ भारती पवमानस्य सरस्वतीका मही । इम नो यज्ञमा गमन्तिस्त्रो देवी मुपेशस ॥ R V 9/5/8

⁴⁹ राजानो न प्रशस्तिभि सोमासो गोभिरञ्जते । यजो न सप्त धातृभि ॥ R V 9/10/3

again. An alternative mythological belief is that Soma's twenty-seven wives were daughters of *daksa*. *Daksa* was aggrieved that his son-in-law paid far too much attention to just one of his wives, *rohini*. He cursed *soma* to wither and die, but the wives of *soma* intervened and the curse was mitigated to that periodic and recurring withering and death enabling *soma* to be born again and again after each death as it were. This is symbolized by the periodic waxing and waning of the moon.

The history of soma yajña:

Introduction:

The earliest mention of *soma* and *somayajñas* are to be found in the *rgveda* which is the oldest of the *vedas*. Thus there is no doubt that *somayajñas* are as old as *vedic* history. *Yajñas* have formed an important part of *vedic* worship since the very beginning of *vedic* religion and culture. Amongst the various *yajñas*, the *somayajñas* are one of the oldest and most important groups of *yajñas*. *Somayajñas* have been performed by many great men in our ancient history. The results obtained by them are well documented. In the middleages also there are records referring to the performance of this type of *yajñas*. In the past millennium, particularly in the last three hundred years or so, we find evidence of the *somayajñas* being performed for specific personal reasons as well as for the general welfare of people. Thus throughout our long history extending over several thousands of years, we find instances of the *somayajñas* being prevalent in various regions of our country. This is one of the great unbroken rituals which have been faithfully followed by our people since the beginning of our civilisation. It is important to note that *yajñas* are performed according to our divine and sacred scriptures called 'the *śruti*' which our *rsis* have received from divine sources directly and which they have recorded for the benefit of posterity.

Ancient history:

Scriptures:

There are numerous references to the *somayajñas* in our scriptures and ancient texts. It is difficult to quote them all due to constraints of time and the scope of this booklet. However, we will mention a few here to convey an idea of the antiquity of this *yajñas*.

There are many references in the *vedas* to *soma* and *Soma sacrifices*. These have been mentioned in the chapter “*soma* and the *vedas*”. It is mentioned in the *śrīmadbhāgavatam* ⁴³³ that having performed the *vājapeya* sacrifice, *dakṣa* (confident of the support of *brahma*) and insulting those who were skilled in knowledge (and neglecting lord *śiva*) began the best of the sacrifices called *brhaspati śiva*. The *vājapeya* sacrifice is a type of

The *śrīmadbhāgavatam* ^{9 14 10-14} mentions about the son of Soma who was of great intelligence and effulgent like gold. It is stated ^{ibid 3 13 38} that *soma* is the fluid that procreates life. *Risī cyavana* ^{ibid 9 3 12} tells the *aśvini-kumārās* that although they are ineligible to drink *soma-rasa* in sacrifices, he will give them a full pot of it in return for youth and good looks. There is specific mention ^{ibid 9 13 7} that *nimmī*’s body was preserved in fragrant substances at the end of the *sattra* Sacrifice. This sacrifice is a type of *somayajñas* which is of a very long duration. The *yajurveda*, *taittirīya saṃhitā kāṇḍa* one *prapāthaka* two deals entirely with the *somayajñas*.

Soma Yāgas Performed by Famous Kings & Rishis

The *atirātri-yāga* and the *ukhtya-yāga* were performed by king *daśaratha* to beget sons. *Risī cyavana* performed it for King *sharyāti* to get sons. King *janaka* performed the *vājpeya-yāga* at the time of the *swayamvara* of *śrī sītā padma purana*.

5/40

In ancient times, *soma* was pressed in almost every temple of the *deva* kingdom, using the *linga*, a heavy stone-mill. According to the legends, it was their key weapon in the long conflict with the *asuras*.

In more recent times, there is evidence of facilities in places like vijayanagar which produced considerable quantities of *soma*. Soon *soma* became an important element in the struggle for power and a potent political instrument in statecraft. In due course valuable evidence like statues and reliefs showing ingredients or the procedure of making were destroyed. Eventually, the recipe was hidden and only known to the highest dravidian priests in the South.

The modern history of the soma yāga:

In the 19th century it was Martin Haug who succeeded in persuading Brahmins in Pune to perform a *soma-sacrifice* and allow him observe all the rituals from nearby. This was quite unprecedented. He was also permitted to photograph the sacrificial utensils and take them to Europe, something which had never been done before at least openly. Haug was then studying the *aittareyabrāhmaṇa*, the vedic text which he was editing and translating. He felt that the close observation of the *soma yāga* would help him to get a better understanding of his subject. Other scholars in his time were only too happy to make use of the collection and the photographs made by Haug while pursuing their studies of *vedic* rituals. W. Caland and V. Henry, for instance, added a table of photographs of Haug's collection to their study of the *agnistoma*. In 1969, perhaps after some centuries, a purely non-violent *somayāga* was performed at *śhivapurī* under the supervision of Param-Sadguru-Shree-Gajanan-Maharaj. In 1975, Indologist Fritz Stāl documented in great detail the *agnicayana-yāga* performed by Nambudiri Brahmins in Kerala. The last such *yāga* had been held in 1956, and the Nambudiris were rightly concerned that the ritual might die out due to non-performance over a long period of time. In any case, no outsider had ever witnessed it. In exchange for a financial support towards

the cost of the ritual, the Nambudiris agreed that the *yāga* could be filmed and recorded. The *yāga* was performed from 12 to 14 April, 1975. The tradition of *vedic* rituals had become quite weak, and without the encouragement and support of Stāl, the ritual would probably not have been performed. In this particular performance, it was necessary to take into account new circumstances not catered for in the traditional rules of the ritual. The ritual was to be filmed, and extensive sound recordings were to be made. The *yāga* attracted much media attention, and there were strong protests against the killing of sacrificial animals. At the last moment it was decided to use non-sentient alternatives. The publicity generated greater awareness in the public of our ancient and most invaluable *yāga* traditions. This also encouraged traditional Brahmins to engage themselves again in the performance of major *śrauta* rituals. Since the 1980's two persons have been very active in the organisation of the major *vedic* rituals, Mr. Selukar Maharaj and Mr. Nana Kale. Both have succeeded in going through the *gavām-ayana* in 1999-2000. This is a sacrificial session (*sattra*) lasting for a year in which Soma is pressed and offered. The *jyotistoma/agnistoma* and the *pravargya* are recurring elements in this complex ritual. There is a film which has recorded the *vedic pravargya* Ritual performed in Delhi, from December 11-12, 1996. It shows the *pravargya* as performed in an eleven-day Soma-Sacrifice. This is a *soma-yāga* in which unlike the *jyotistoma*, the pressing of Soma is not restricted to one day. In the case of the *pravargya*, a larger number of pressing days makes no difference. After the 1975 *agnicayana*, there have been several more Nambudiri *śrauta yajñas*. In 1984, the *agnistoma* was performed at Trivandrum. In 1990, the *agnicayana* was done at Kundoor. In 2003, the *agnistoma* was performed at Trichur. In 2006, both the *atirātra* and *agnistoma* were held in the same place. The *agnistoma* was performed for the first time in 222 years at Aluva from 25 April till 1 May, 2009. In recent times, two *soma-yāgas* were conducted at Bangalore and Nanded.

The soma yāga:

The classification of soma yāgas:

The name *soma yāgas* has been given to this group of ancient and time-honoured *vedic* sacrifices because the juice of the *soma* plant is the main *havis* or oblation offered in these sacrifices. As we have already seen, the *soma* plant and the juice are considered divine and a god in its own right. Moreover, *soma* is the beloved of all Gods who are ever eager to come to the *soma* Sacrifices if invoked properly and partake of the *soma* and other oblations. Thus *soma yāgas* are accorded great importance in the *hindu* tradition of sacrifices. From the point of view of the time needed to complete the *yajña* rituals, *soma yāgas* are divided into four categories as follows -

- 1 *ekāha*
- 2 *ahīn*
- 3 *sādhyaska*
- 4 *sattra*

That *soma yāga* which takes one day for completion is called ‘*ekāha*’. Those that take from two to eleven days for completion are termed ‘*ahīn*’ and those that take between thirteen and thousands of years for completion are called ‘*sattra*’. It may be kept in mind that the time-frame mentioned above for completion of the *yāgas* is the time needed to perform the main *yajña* rituals fully. It does not include the time needed for various preparations and preparatory rites which have to be completed before the main *yāga* rituals can commence. These include various preparations like nomination of the priests, planning and construction of the facilities, collection of the implements and materials, purificatory rites, and ceremonial extraction of the *soma* juice. For instance, in the case of the *ekāha soma yāga*, it takes four days for all the pre-*yāga* preparations to be completed. Thus the *ekāha soma yāga* takes a total of five days from the moment of *samkalpa* or formal resolve to the formal ending of the *yāga* i.e. four days for preparations and the

subsidiary rites and one day for conduct of the main rites. However, in the event, all the actions that are normally done over five days can be completed in one day, then such a *yāga* is called '*sādhyaska*'. The *ahin soma yāga* which takes twelve days forms the basis for all other *ahin soma yāgas*. Similarly, the *sattra soma yāga* which takes twelve days is the model for all *sattra soma yāgas*. The *sattra soma yāgas* are also divided into two groups, namely '*rātri sattra*' and '*ayan sattra*'. Of these, those that take between twelve and 100 days are called '*rātri Sattra*' while those that take more 100 days are termed '*ayan sattra*'. There are seven types of *ekāha soma yāgas* as follows -

- 1 *agnistoma*
- 2 *atyagnistoma*
- 3 *ukhthya*
- 4 *sodaśi*
- 5 *atirātra*
- 6 *vājpeya*
- 7 *aptoryāma*

The hymns of the *sāmaveda* which eulogise *agnideva* are called *agnistoma*. The *somayāga* which is concluded with the recital of the *agnistoma* hymns is called the *agnistoma soma yāga*. In the same manner, the other six *soma yāgas* are named respectively after the six different *sāmaveda* Hymns which are sung at the end. *Agnistoma soma yāga* is the model for all the other *ekāha soma yāgas* which are derived by applying a few variations to the procedure for the *agnistoma soma yāga*. The *agnistoma* is the first of the *soma yāgas*. It is spread over five days and needs all the sixteen priests. It is performed annually in the spring season. The first four *soma yāgas*, namely *agnistoma*, *ukhthya*, *sodaśi*, and *atirātri* are also called *jyothistoma yāgas* because in these four *yāgas*, the hymns recited are called '*jyothi*' or 'Light'.

Stotras:

In the *agnistoma yāga* twelve *stotras* are recited. *Stotras* are hymns of the *sāmaveda* which contain laudatory verses in praise of the Gods. In the *ukhtya soma yāga*, in addition to the twelve verses of the *agnistoma soma yāga*, three more *stotras* are recited making a total of fifteen verses. In the *sodaśī soma yāga*, in addition to the fifteen *stotras* of the previous *yāga*, an additional *stotra* is recited making a total of sixteen *stotras*. In the *atyagnistoma soma yāga*, the twelve *stotras* of *agnistoma* are recited followed by the recitation of the single *stotra* of *sodaśī soma yāga*. Thus the *atyagnistoma soma yāga* has a total of thirteen *stotras*. The number of *stotras* in the *vājpeya soma yāga* is seventeen, in the *atirātri soma yāga* it is twenty five and in the *aptoryāma soma yāga*, it is thirty three.

Shastra:

As stated earlier, *stotras* are hymns of praise of the Gods in the *sāmaveda*. Before the *yāga* begins, the Gods are praised by recitation of these laudatory hymns. Thereafter, the same Gods are again praised by recitation of the hymns from the *rgveda*. The group of such hymns from the *rgveda* are collectively known as 'śāstra'.

The mode of recitation:

As mentioned previously, in the southern half of the *sadomantapa* is erected the *audumbarī* which is the thick round wooden pillar of the height of the *yajamāna*.

Touching this pillar, facing the north, the west and the east, sit the priests named *udgātr*, the *prastotā*, and the *pratihartā* in that order. They recite the *stotras* in different permutation and combinations. Close to them, in the *sadomandap* itself, to the west of the *khars* named *dhīshnya* and facing the east, sit the following priests from the north to the south in this order – *achhāvāka*, *nesta*, *pota*, *hoti*, *matrāvaruna* (*pratiprashthātā*), and *grāvastut*. These seven priests recite hymns from the *rgveda* known as *śāstra*. The *stotras* are recited first followed by the *śāstra*. In every *somayāga*, the number of *stotras* and *śāstra* are equal. But three

rgveda hymns are based on one hymn of the *sāma veda*. Hence, the same *rgveda* hymn is repeated three times in different permutations. The recitation is begun by the priest called *prastotā* and after every cycle of repetitions, *kuśa* (small stick) is kept in front to facilitate counting as the recitation proceeds forward.

The yajñasālā:

The *yajñasālā* is the specially built hall or superstructure under which the *yajña* is conducted. It provides a degree of privacy for the *yajña* rituals as well as overhead protection from the sun, wind, dust and rain for the *kundas* or ceremonial fires lit underneath, the materials being used and the people taking part in the *yajña*. The roof is traditionally made of leaves or thatch supported by poles of wood or bamboo. In our times, *yajñas* have been performed under structures having a roof of canvass or thick cloth as in *shāmianās*, and even semi-permanent or permanent structures with tiles or concrete roofing have been used. The *yajnyashāla* has to be large and spacious for conducting the major *yajñas* such as the *soma yāgas* which involves many different fireplaces, altars and a large number of participants. The process of construction begins with the proper alignment and marking of the *prushtyā* or the central axis which is the east-west line running in the centre of the area earmarked for the *yajña*. This is a most important line. All the *shālas* or halls, and other major facilities are constructed symmetrically astride the *prushtyā*. It is also the reference line dividing the various sectors and for planning and siting the other facilities. The marking of this line is done either by embedded bricks or white lime powder. The *yajñasālā* consists of two major enclosures called the *Prāgvanshshāla* and the *mahāvedī* which contain most of the facilities required for the *yāga*. Some other relatively minor facilities are located outside the boundaries of the two enclosures and in two cases, half inside and half outside.

The prāgvanshshāla:

Astride this central axis equally to the north and the south, a large hall is constructed which is called the *prāgvanshshāla*. This hall is constructed towards the western end of the general area earmarked for the *somayāga* so as to leave the major portion of the area to the east of the *prāgvanshshāla* free for construction of the *mahāvedī* which we shall discuss later. The length as well as breadth of this *shāla* or hall is either ten or twelve *aratnis*. The *aratni* is the *vedic* unit of measurement which is equivalent to the distance from the elbow to the tip of the fingers of the *yajamāna*. The *prāgvanshshāla* is also called *prāchīnavanshmandap* or *vumit*. This hall has four doors, one in each of the four directions. Each door is of the width of two *aratnis*. The roof is covered with dried grass or thatch. The main central bamboo or wooden pole supporting the roof lies directly over the *prushtyā*. To the east of the western door at a distance of two *aratnis* astride the *prushtyā* is built a round fire-place or fire-altar called the *gārhapatya*. Similarly at a distance of two *aratnis* west of the eastern door and astride the *prushtya* is built a four-cornered fireplace called *āhavanīya*. In between the *gārhapatya* and the *āhavanīya* is built the *vedi*. To the north of the *gārhapatya* and the *āhavanīya* respectively are built round plinths called *pravanjnīya khar* and *udvāsanīya khar* which are mounds of earth about three to four fingers in height. These two mud plinths are also termed *dharmakhars*. With respect to the *udvāsanīya khar* is built the *ābasadhyāgni* fire-place to the east and in the north-eastern corner is built the *ucchishtakhar*. To the south of the *āhavanīya* is the *sabhyāgni* fire-place. To the south of the *āhavanīya* is the *rajasandī* and to the east of the *rajasandī* is the *samādasandī*. These are four-legged platforms. Close to the southern door but outside the *prāgvanshshāla* are four pegs for tying cows and goats and their young ones. The half-moon shaped fire-altar called the *dakshināgni* is located to the south of the *gārhapatya*. In the south-western corner of the *shāla* is located the *patnīshāla* which is enclosed on all sides with bamboo thatch or *kanāt* (canvass/thick cloth sheets). The *prāgvanshshāla* is

also enclosed by bamboo thatching. The construction of the *prāgvanshshāla* is done before the commencement of the *yāga*.

The somayāga ritual:

Introduction:

The *somayāga* rituals are not only complicated but very elaborate. It is impossible to mention all the rituals in detail for every type of *somayāga* as it is beyond the scope of this work. We give below the salient aspects of the *agnistomayāga* which is the basis of all the other *somayāgas*. The various mantras to be recited are highly technical and only the most competent priests have proper knowledge of the *mantras*. The procedures are also very complex and elaborate and require the close supervision of well read and well versed priests. Those who wish to learn more about the detailed rituals and the *mantras* should do so directly from knowledgeable priests who have sufficient experience in performing the *somayāgas*.

Qualifications & pre conditions for performance:

The *somayāga* can be performed only by the *dvijas* or twice born. There are two contingencies catered for by the rules in the *śāstras* as follows.

A *dvija* who is an *anāhutāgni* or one who is devoid of the sacred fires can perform the *somayāga* in the *vasantaritu* or the spring season after first performing the ceremony of *agnyādhāna* according to the procedure prescribed. A *dvija* who has performed *agnyādhāna*, *agnihotra*, *darshapurnamās*, and *chāturmāsya* *yāgas* in their correct time can perform the *somayāga* in the *vasantaritu*. A person whose father or grandfather has not performed the *somayāga* is not eligible for performing this *yāga*. Similarly, that *brahmin* whose father and grandfather have not studied the *vedas* or not performed the *śrauta haviryajñas* is not entitled to perform the *somayāga*. However, the *śāstras* prescribe certain propitiatory rites to overcome

these restrictions Prior to the commencement of the *yāga*, the priests are selected The nominated priests are duly invited through the priest named *sompravāk* Upon being so invited, the priests present themselves at the appointed time and place

The Rituals:

On the First Day:

At the auspicious time laid down, the *yajamāna* performs the *yāga-samkalpa* or the formal resolve to perform the said sacrifice The Priests are then ceremonially welcomed and honoured The words which pertain to the *varunamantradeva* are uttered in a low tone while those pertaining to human beings are uttered in a louder voice Thereafter, the *yajamāna* seeks from the Raja the *devayajan* or the appropriate piece of ground for conducting the *yāga* by uttering, the words, “*devayajanam me dehi*” If the *yajamāna* is the *rāja* himself, he seeks the same from the priests On this day the *prāgvanshāla*, the *patnīshāla*, and the *vrataśrapanāgāra* (the place for heating up the milk for the consumption of the *yajamāna* and his wife) are all erected

At his home, reciting the *mantra* ‘*yam te yoni*’, the *yajamāna* warms the *aranis* over the *gārhapatya* and the *āhavanīya* fires He then extinguishes these two fires in his house, takes up the heated *aranis* and together with his wife goes to the *devayajan*, enters the *prāgvanshāla* through the eastern door and touches the centre pole The various articles for the *yāga* are also taken to the *devayajan* Then the fire created by rubbing the two *aranis* is used by the *adhvaryu* to ceremonially light the *gārhapatya* and *āhavanīya* fires in the *prāgvanshāla* To the north of the *prāgvanshāla*, the *yajamāna* has a haircut, then his nails are trimmed and he has bath Except for the hair-cut, the wife also follows the same ritual Then the *yajamāna* and his wife eat a meal of their choice When they are seated in the *prāgvansāla*, the *dīksanīya īsta* ceremony is performed The main deity of this ceremony is *agnāvishnu* and the *havis* is *ekādashkapālpurodasha* After this, the

yajamāna and his wife are given *dīksa*. As soon as it is announced that the couple have been given *dīksa*, they remain silent till the stars come out. That night, they observe a fast, taking only milk and keep awake the whole night. So ends the first day of the *agnistomayāga*.

The Second Day:

On the second day, first of all, the *prāyanīya* or *ārambhanīya ista* ceremony is performed which is the starting ceremony. The main deities of this *ista* are *pathyā svasti*, *agni*, *soma*, *savitā*, *aditi* and *agni svistakrt*. Thereafter at the site called *uparava*, the ceremonies with regard to *soma* begins. The *adhvaryu* gives the *hiranyavatī āhuti* in the *āhavanīya*, and together with the *yajamāna* lights it behind the cow called the *somakṛpani* and walking behind the cow, puts gold at the cow's seventh step and invokes *aditi*. The *yajamāna* then makes a *tyāga* or donation of ten things which includes one year old cow, gold, goats, bull, cart and so on by means of which the God *soma* is purchased. Then Lord *soma* is ceremonially brought unto the eastern door of the *prāgvanshśāla*. Then the *ātutyeshṭi* ceremony of *soma rāja* is performed with due reverence. The presiding deity of this ceremony is *śrī viṣṇu* and the *havis* is *navakapāl purodāśa*. Thereafter, Lord *soma* is carried in a vehicle and taken to the *rajasandhi* located south of the *āhavanīya* and east of *brahma* where Lord *soma* is kept. The ghee which is leftover after this ceremony is kept in four or five small vessels and all the priests as well as the *yajamāna* touch the ghee in a symbolic representation of an oath not to oppose each other during the *yāga*. Then all of them holding *kuśa* grass in their hands and reciting the appropriate mantra, “*amshuramshuste deva somāpyāyatām*”, sprinkle hot water on the *soma* and perform the *somāpyāyan*. This is symbolic of satisfaction. Then a ceremony is performed in which the left palm is placed over the right palm placed on the *prastar* as a symbolic gesture *namaskāra* called *nihanva*. The *somāpyāyan* and the *nihanva* are performed twice every day. The *pravargya* (heating milk and offering to the

aśvins and *upasad* (homage or worship) ceremonies are important features of the *somayāga*. They are performed twice a day at sunrise and sunset. After the *upasad*, *somāpyāyana* and *nihanva* are performed. Thereafter under the leadership of the priest called *subrahmanya*, Lord *indra* is invoked to come and partake of the *soma*.

The Third Day:

After the rituals of *pravargya*, *upasad*, *somāpyāyan*, *nihanva*, have been duly performed the construction of the *mahāvedī* is carried out. We have already described the layout of the *mahāvedī*. In the evening also all the morning rituals, the *pravargya* and others are performed. The *adābhyagraha* is performed in which the *adābhyagraha* is filled with curds or milk, three parts of the *soma* plant are placed on the *graham*, and the mantra *āhuti* of *somadeva* is performed reciting the mantra, “*yat te somādābyam nāma*”⁵⁰. Then the *amśugraha* ceremony is done. In this ritual, one *graha* full of *soma* plant is taken according to capacity and placed on the grinding stone, and it is wetted with the *vastivavarī*. Then using a stone called *upāmsūsavan*, it is struck once making a single dent on the *soma* plant. The juice is then extracted and is filled in the same container. Then uttering the words, “*prajāpati svāha*”, the *āhuti* of *prajāpati* is performed. The *soma* juice is divided into two lots. The bigger portion is for consumption in the morning and the smaller portion is for the afternoon. Then follow the rituals called *mahābhīṣṇav*, *antaryāmagraha*, *grahagrahanāsādan* which involves the ritual extraction of *soma* juice, its consecration and the formal invitation to the Gods to partake of it. Thereafter the rituals called *praspana*, *bahispamānastotra*, *savanīyapaśu*, *dvidevatyā*, *śukīāmanthi*, *hrtugraha*, *indrāgnagrahagrahana*, *ājyaśāstra*, *indrāgnagraha*, *vaiśvadevagraha*, *prathama ājyastotra*, *prauga śāstra*, *vaiśvadevagraha*, *ukthya graha*, *dvitīya-trīya-chaturtha ājyastotra*, *matrāvaruna*, *brāhamanāchhamṣi*, *achhāvāk śāstra*, *matrāvaruna*, *indrāgnagraha* which are part

⁵⁰ T S 3 3 3

of the first group of *yajña* rituals classified under the heading *prathama savana*. All these rituals are elaborate and should be done under expert guidance. There are many other rituals performed over the fourth and final days which are not only complicated but very elaborate and highly technical. It is beyond the scope of this work. Hence we shall only mention the names of these rituals. Interested readers are advised to study the same from the relevant texts and only under the guidance of expert priests or scholars of our *vedic* traditions.

The Fourth & Fifth Days:

Over the fourth and final days the following rituals are performed -

1 *Mādhyandina savana*- which consists of the following rituals *somābhishana*, *grahagrahana*, *prasarpana*, *mādhandin pavmāna stotra*, *dadhidharma orachār*, *savanīya purodāśayāga*, *śukrāmantha pracāra*, *hotrakacamasa pracāra*, *savanmukhabhaksa*, *daksinā homa*, *vibhāga*, *dāna*, *vaiśvakarmana homa*, *Marutvatīyayāga*, *graha grahana*, *śāstra graham*, *Orachār*, *mandra graha grahana*, *prstastotra*, *niskarvalyaśāstra*, *māhrndragraha pracār*, *atigrāhyagraha pracāra*, *ukthyagraha pracāra*, *prstastotra* and *śāstra* (three each)

2 *Tṛtīyasavana* which consists of the following rituals *ādityagrahapracāra*, *abhisava*, *grahagrahana*, *prasarpana*, *ārbhavapavamānastotra*, *savanīya havi pracāra*, *hotrcamasa pracāra*, *sāvitrgraha pracāra*, *vaiśvadevagrahagrahana*, *vaiśvadevaśāstra*, *vaiśvadevagrāha pracara*, *saumyacarū*, *pātnīvatagraha pracara*, *camasagrahana*, *agnistoma stotra*, *agnimāruta*, *śāstra camasa pracara*

3 *The yajñapṛcca* which consists of the following concluding rituals *anuyājādi*, *hāriyojana pracāra*, *avabhrtesti*, *udayanīyesti*, *amibandhyāyāga*, *devikāhavi*, and *udavasānīyesti*

We shall describe the final ritual called *udayanesti* (*samāpanīya*) briefly as a matter of interest. After the *devikāhavi*, the *uadayanīyesti* is performed at the *śālāmukhīya agni*. This is performed in the same manner as the *prāyanīyesti* ritual. In the previously established *charupātra*, *charu* (milk rice porridge) is cooked. The principal Gods are *agni*, *soma*, *savitā*, and *pathyāsvasti* in that order. After the *udayanīya* is over, the *anubandhyāyāga* is performed. The main deity of this ritual is *maitrāvaruna* and the *havis* is *āmikṣa*. This is followed by five *devikā āhutis* and one *āhuti* of *dvādaśa purodāśa*, to the family deity. Thereafter, the *caru* cooked earlier, and kept in the four *pātras* are offered as four different *āhutis* to *anumati*, *rāka*, *sinīvālī* and *krha* respectively. After the hair cut of the *yajamāna*, the *agnis* are merged with the *aranis*. Returning home, the domestic fires are again lit by rubbing the *aranis* together and the ritual of *advāsanīya ista* (*devajana tyāga*) is performed. The main deity of this ritual is *agni deva* and the *havis* is *kapāla purodāśa*. Alternatively, instead of this *ista*, the *havi visnu mantra* can be recited while offering one *āhuti* of the *ājya* in the *āvahaniya* fire. This concludes the *agnistoma yāga*.

Thus we get to know the role of plants and in particular *soma* plant in the performance of *yāgas*.

All the major *yāgapātras* explained in the above passages are prepared chiefly out of these plants found in the table below

Chapter 2:

Sacrificial effect of the Medicinal Plants on the human body and external Environment

Concept of Sacrifice 'yajña':

The sacrifice or *yajña* is regarded as an important concept of Vedic thought and religion but when we study it in its broader sense, it seems to be a part of Vedic environmental science. *Yajurveda* and *rgveda* describe it as the 'navel (nucleus) of the whole world'⁵¹. It hints that *yajña* is regarded as a source of nourishment and life for the world, just as navel is for the child. *Vedas* speak highly of *yajña*. Through it, seers were able to understand the true meaning of the *mantras*⁵². All sorts of knowledge were created by *yajña*⁵³. It is considered as the noblest action⁵⁴. In simple words, *yajña* signify the theory of give and take⁵⁵. The sacrifice has three aspects: *dravya* (material), *devatā* (deity) and *dāna* (giving). When some material is offered to a deity with adoration, then it becomes *yajña*. Pleasing deity returns desired material in some different forms to the devotee. This *yajña* is going on in the universe since beginning of the creation and almost everywhere for production and, also for the sustenance of the world. Even the creation of universe is explained as *yajña* in the *purusasukta*. Thus, the concept of *yajña* seems to be a major principle of ancient environmental science.

In environment all elements are inter-related, and affect each other. Sun is drawing water from ocean through rays. Earth gets rain from sky and grows plants. Plants produce food for living beings. The whole process of nature is nothing but

⁵¹ अयं यज्ञो विश्वस्य भुवनस्य नाभिः । TS 13.62 ॥ अयं यज्ञो भुवनस्य नाभिः । RV 1.164.39

⁵² यज्ञेन वाचं वदवीयमायन् । RV 10.71.3

⁵³ तम्मात् यज्ज्ञात् सर्वहुतं रुचं मामानि जज्जिरे ॥ RV 10.90.9

⁵⁴ यज्ञो वै श्रेष्ठतमं कर्म ॥ SB 1.7.15

⁵⁵ परस्पर-भावना ॥

yajña This is essential for maintenance of environmental constituents. The view that *yajña* cleans atmosphere through its medicinal smoke, and provides longevity, breath, vision etc, is established in *yajurveda*⁵⁶. Few scholars have attempted to study the scientific nature of the Vedic *yajña-s*. Undoubtedly, they have never been simple religious rituals, but have a very minute scientific foundation based on fundamental principles.

According to Vedic thought, *yajña* is beneficial to both individual and the community. *Yajña* helps in minimizing air pollution, in increasing crop yield, in protecting plants from diseases, as well as in providing a disease-free, pure and energized environment for all, offering peace and happiness of mind.

Now let us arrive to a very relevant aspect of *yajña* - i.e., its direct and proven impact on ecology. Given the alarming proportions that the harm caused by our indiscriminate use of natural resources has assumed, the significance of *yajña* becomes proportionately high. This *vedic* science can effectively reverse the man-made imbalances that have become a global concern. However, to understand the relationship between *yajña* and ecology, we must understand ecology first.

Most of us possess a basic awareness of the subject, but to understand the impact of *yajña* on ecology, we must understand ecology and hone our scientific awareness to appreciate the scientific impact of *yajña*. So we will delve in to ecology as defined by modern science and also parallel look at the approach of *vedic* sciences to understand the causes and effects of an unbalanced ecology and finally see how *yajña* can repair the damage already done and pre-empt future imbalance.

Ecology according to modern science:

Ecology is essentially the study of the workings of the earth. It is the scientific study of the distribution and abundance of living organisms and how these properties are affected by interactions between organisms and their environment.

⁵⁶ आयुर्यज्ञेन कल्पताम् । प्राण यज्ञेन कल्पताम् । चक्षुर्यज्ञेन कल्पताम्॥ TS 9.21

The environment of an organism includes physical properties, which can be described as the sum of local abiotic factors like climate and geology, as well as other organisms that share its habitat. The term *oekologie* was coined in 1866 by the German biologist Ernst Haeckel; the word is derived from the Greek *oikos* (household) and *logos* (study) – therefore, ‘ecology’ means the ‘study of the household of nature’. The ecology of a region consists of two factors- environment and atmosphere.

Atmosphere: The atmosphere is the mass of air that envelops the earth from all sides, containing many gases and particles of various materials. Nitrogen and oxygen constitute the major part (99 percent). The atmosphere also contains water vapour, sand particles, smoke, salt, volcanic ash particles, meteoric dust, pollen and gases like methane, nitrous oxide, carbon monoxide, hydrogen, ozone, helium, krypton, xenon, etc. in minor proportions.

It is estimated that the atmosphere extends up to a height of 1000 km above the earth’s surface. The pressure, density and temperature of the atmosphere varies with height. It is dense near the earth’s surface and rarefies with height. The atmosphere around the earth’s surface is in five different layers, which help to protect living beings from the dangerous radiations of the sun, meteors, etc. The bio-kingdom dwells in the first layer called the troposphere, which extends up to a height of 17 km. Rain, clouds, storms and snow form in this part. The second layer, the stratosphere, extends up to 50 km and contains ozone in its upper portion. The other three layers are the mesosphere, the ionosphere and the exosphere.

As the atmosphere protects us from dangers such as exposure to radiation, climatic extremes, etc. any harm to this protective can prove self-destructive not only for the human race, but also for the entire living kingdom.

Environment: The environment is the totality of surrounding conditions, the area in which something exists or lives, the interrelationship between living things and their environment, or the study of these interrelationships. It could be said to comprise that 'natural environment' and 'developed environment'.

The natural environment includes all the living and non-living things that occur naturally on earth, in contrast to a developed environment, which is the result of human activity or intervention. Some would argue about the usage of the term 'natural environment', in that most natural environments have been directly or indirectly influenced by human beings. In order to address this concern, some level of human influence is thus allowable without the status of a habitat ceasing to be 'natural'. The meaning of the term, however, is usually dependent more on the context than a specific definition. Many natural environments are the product of interaction between nature and human beings. For this reason, the eco system has been used to describe an environment that contains nature and also includes people. It follows then that environmental problems are human or social problems.

Vedic view of ecology:

The *vedas* are the first texts in the library of mankind. They are universally acknowledged to be the most precious Indian heritage. The antiquity to the Vedic civilization is debated to a great extent but indeed there is no civilization known to humanity with such antiquity as Vedic civilization. The so-called *āryans* would have originated in the *āryāvartā*. N. J. Lockyer has declared 'The Vedas, in fact, is the oldest book in which we can study the first beginnings of our language and of everything which is embodied in all the languages under the sun'.

The Vedas deal with knowledge, the knowledge of all sorts. They cover knowledge both physical and spiritual. They are source of all knowledge according

to *manusmṛti* ⁵⁷ Especially the Vedic views revolve around the concept of nature and life. The visions of the beauty of life and nature in the Vedas are extremely rich in poetic value. Perhaps nowhere else in the world has the glory of dawn and sunrise and the silence and sweetness of nature, received such rich and at the same time such pure expression. The symbolical pictures projected there remain close to life and nature. The most authoritative among the four Vedas is called the *ṛgveda*. Each Vedic verse has one or more sages (*ṛṣi*-s) and deities (*devatā*-s) associated with it. Generally, *ṛṣi*-s are supposed to be the recipient of knowledge revealed in the verses and *devatā*-s are supposed to be the gods in whose praise verses are revealed.

The oldest and simplest form of nature-worship finds expression in Vedic texts. Many scholars have come to the conclusion that the *vedas* are primarily concerned with cosmology, however, they are not in a position to show that *vedic* cosmology has the solutions to the most difficult problems of modern cosmology ⁵⁸ Some say, like dramas are played to remember history, the process of various *śrauta yajnas* describes the science of cosmology ⁵⁹

The *vedic* hymns are full of statement, ideas and unusual images which contain truth of all sciences. Here, knowledge is couched in symbolic language and unless the symbols are decoded, the real purport of the *mantras* cannot be understood. The only point is that *vedas* need to be studied and interpreted, not in a pedantic manner, but in their proper perspective and in relevant context. Generally indication of most of the principles is there in their earliest form. Often expressions of ideas are enveloped with the shade of symbolism. The approach of *vedic* seers is truly comprehensive. They do not visualize in parts. They do not elaborate subjects as is done in current education. But at the same time, grandeur and brevity of the

⁵⁷ सर्व वेदात् प्रमिथ्यति॥ MS 2.7

⁵⁸ Raja Ram Mohan Roy, *Vedic Physics, Scientific Origin of Hinduism* Golden Egg Publishing, Toronto, 1999, p 6

⁵⁹ युधिष्ठिरमीमासा, वैदिकमिद्वान्तमीमासा, Sonipata, 1976, p 40

vedas are not found in the disciplines of modern science. The *vedas* and disciplines of modern science are rather complementary and not contradictory. If modern science is seen or read through *vedic* eyes, the students will be much benefited. Students of science may search the earliest of the ideas about any discipline in the *vedic* literature.

In recent days, environmental science and ecology are disciplines of modern science under which study of environment and its constituents is done with minute details. As science, they are established in 20th century, but their origin can be seen long back in the Vedic and ancient *samskrta* literature. The concepts of environment differ from age to age, since it depends upon the condition, prevalent at that particular time. In this paper, an effort is made to find out the awareness of ancient Indian people about the environment. As *samskrta* literature is so wide we refer here mainly to Vedic texts, particularly the *vedic samhitā-s*.

The Environment (Protection) Act, 1986 defines the environment as follows: 'Environment includes water, air and land and the inter-relationship which exists among and between water, air and land and human beings, other living creatures, plants, micro organisms and property'.⁶⁰ From the above definition, it can be briefly said that environment consists of two components namely biotic (living organisms) and abiotic (non-living materials) factors. The living organisms can be grouped into three types - those living mainly on land, in water and in air. The non-living materials of the environment are land, air, water, property etc.

In modern *samskrta*, the word *paryāvarana* is used for environment, meaning which encircles us, which is all around in our surroundings. But in the *atharvaveda* words equivalent to this sense are used, such as *vatāvatā*⁶¹ *abhīvārah*⁶² *āvatā*⁶³

⁶⁰ A R Panchamukhi, Socio-economic Ideas in Ancient Indian Literature, Rashtriya Sanskrit Sansthan, Delhi, 1998, p 467

⁶¹ वतावता AV 12.1.52

⁶² अभिवार AV 1.32.4

parīvata⁶⁴ etc Vedic view on environment is well-defined in one verse of the *atharvaveda* where three coverings of our surroundings are referred as *chandāmsi* ‘Wise utilize three elements variously which are varied, visible and full of qualities These are water, air and plants or herbs They exist in the world from the very beginning They are called as *chandāmsi* meaning ‘coverings available everywhere’⁶⁵ It proves the knowledge of *vedic* seers about the basic elements of environment

Vedic approach to environment:

The *vedic* aged people were children of nature They studied nature’s drama very minutely Sand-storm and cyclone, intense lightening, terrific thunderclaps, the heavy rush of rain in monsoon, the swift flood in the stream that comes down from the hills, the scorching heat of the sun, the cracking red flames of the fire, all witness to power beyond man’s power The *vedic* sages felt the greatness of these forces They adored these activities They appreciated these forces They worshiped and prayed them due to regard, surprise and fear They realized instinctively that action, movement, creation, change and destruction in nature are the results of forces beyond men’s control And thus they attributed divinity to nature

(1) **Divinity towards nature** Rīgvedic hymns could be divided into many parts, but their main part belongs to Natural hymns, the hymns related with natural forces Yet *vedic* gods are explained in different ways by the scholars of India and West, but speaking generally, the hymns addressed to deities (*devatā*) are under the influence of the most impressive phenomenon of nature and its aspects The word Devata means divine, dignity which is bright, strong, donor, and powerful In these hymns we find prayers for certain natural elements such as air, water, earth, sun,

⁶³ आवता A V 10.1.30

⁶⁴ परीवता A V 10.8.31

⁶⁵ त्रीणि छन्दामि कवयो वि येतिरे पुरुरूप दर्शत विश्वचक्षणम् आपो वाता औपधयस्तान्येकस्मिन् भुवन् अर्पितानि॥ A V 18.1.17

rain, dawn etc. The glorious brightness of the sun, the blaze of the sacrificial fire, the sweep of the rain-storm across the skies, the recurrence of the dawn, the steady currents of the winds, the violence of the tropical storm and other such natural energies, fundamental activities or aspects are glorified and personified as divinities (*devatā*). The interaction with nature resulted in appreciation and prayer but, indeed, after a good deal of observation. Attributes assigned to deities fit in their natural forms and activities, as Soma is green, fire is bright, air is fast moving and sun is dispenser of darkness. The characteristics of these forces described in the verses prove that *vedic* seers were masters of natural science. In *vedic* view, this world consists of *agni* i.e., fire or heat and *soma* i.e., water.

Sun (*sūrya*) is the soul of all which is moving and also of which is not moving. *Indra* is most powerful god who kills *vrtra*, the symbol of cloud to free waters. *Vrtra* means one who covers and is derived from the root *vri*, to cover. R R M Roy opines that the main force of expansion in the *vedic* cosmology is *indra*, and his chief adversary, the main force of contraction, is *vrtra*. *Maruts* are *indra*'s associates. *Vedic* seers pray boldly to these natural forces and aspects for bestowing plenty and prosperity on them. *Aditi* is praised as *devamāta*, the mother of all natural energies and she symbolizes the nature. A famous geologist S R N Murthy has written on the earth sciences in the *vedas*. He has somehow a different opinion about *vedic* gods and hence states, 'the natural geological aspects have been described as *indra*, *agni*, *vāyu*, *varuna*, *usas* etc.

(2) **Cosmic order rta and varuna** In the *vedas*, the order of the universe is called '*rta*'. *Rta* reduces chaos to cosmos, and gives order and integration to matter. It also gives symmetry and harmony in the environment. Hence the conception of *rta* has an aesthetic content too, it implies splendour and beauty. It is for this reason that the *vedic* gods, upholding *rta*, are all lawful, and beautiful and good. Their beauty is a significance attribute. *Rta* is defined variously by scholars in different

vedic contexts, but in general sense it has been elaborated as great ‘cosmic order’ which is the cause of all motion and existence, and keeps world in order. No one can ignore it, even gods are abided by the *rta* and they are born of *rta*. It is controlling and sustaining power. It sustains sun in the sky. *Rta* as Universal Law governs everything in the cosmos. The whole of the manifested universe is working under *rta*. S R N Murthy assumes it as a law of gravitation in simple form. According to H W Wallis ‘The principle of the order of the world, of the regularity of cosmic phenomena, was conceived by the Rishis to have existed as a principle before the manifestation of any phenomena. The phenomena of the world are shifting and changeable, but the principle regulating the periodical recurrence of phenomena is constant, fresh phenomena are continually reproduced, but the principle of order remains the same, the principle, therefore, existed already when the earliest phenomena appeared.’ In the *vedas*, *varuna* is depicted as the Lord of *rta*, the universal natural order. He is sovereign god, great king, law-maker and ruler of cosmos and even of the gods. Basically, he is regarded as the Lord of water and ocean but chiefly he controls and keeps the world in order. From his throne on high he looks down upon all that happens in the world, and into the heart of man. ‘By the law of *varuna* heaven and earth are held apart. He made the golden swing, the sun to shine in heaven. He has made wide path for the sun. By his ordinances the moon shining brightly moves at night, and the stars placed up on high are seen at night but disappear by day. He causes the rivers to flow. As a moral governor *varuna* stands far above any other deity. Thus, the concept of *varuna* represents the consciousness of Vedic seers in respect to controlling and balancing the natural forces in environment.

(3) **Division of Universe** Vedic seers have a great vision about universe. The universe is made on scientific principles, and that’s why it is well measured. The universe consists of three intertwined webs, *prthivī*, *antariksa* and *dyau*. Vedic scientists divided even the length in three calling them upper, medium and lower

The tripartite division of the universe into three regions *prithivī*, the earth, *antariksa*, the aerial or intermediate region which is between heaven and earth, and *dyau*, the heaven or sky is very well established in the *vedic* literature. *Prithivī* can be given a scientific name 'observer space'. It is our space, the space in which we live and die, whatever we can see and observe. From one end of the universe to the other end is the expanse of *prithivī*, and that is what the name *prithivī* means the broad and extended one. *Dyau* can be termed 'light space' because light propagates in this space. *Antariksa* can be termed as 'intermediate space' as this space exists in between observer space and light space. A verse from the *yajurveda* states that the division of universe was done on a subtle level, and not on gross level. The *vedic* sages had the capability of looking at such a subtle level, which is beyond the reaches of modern science. Here, in reference to environmental study, we regard the division of the universe as the most important concept of the *vedas*. Though a large number of gods are described in the hymns, and it is very difficult to arrange them in different classes, but *yāska* in his *nirukta* talks about three Gods: *agnī* in earth, *vāyu* or *indra* in atmosphere and Sun in heaven. Each one of them is known by various names depending on the different actions performed. These three gods are three major forms of energy, fire on earth, air in intermediate space and light in upper region. Other energies of those regions are related to or under them. So generally gods are classified in three groups called upper, middle and lower, and, therefore, provide a system to study atmosphere and its all aspects. Regarding global harmony, *vedic* seers always pray for the welfare of all creatures and all regions.

According to one indigenous theory established in the *upanisad*-s, the universe consists of five basic elements³ viz 1 Earth or land, 2 Water, 3 light or lustre, 4 air, and 5 ether⁶⁶. The nature has maintained a status of balance between and among these constituents or elements and living creatures. A disturbance in

⁶⁶ इमानि पञ्चमहाभूतानि पृथिवी, वायु, आकाश आपज्योतीषि । ^{^U 33}

percentage of any constituent of the environment beyond certain limits disturbs the natural balance and any change in the natural balance causes lots of problems to the living creatures in the universe. Different constituents of the environment exist with set relationships with one another. The relation of human being with environment is very natural as he cannot live without it. From the very beginning of creation he wants to know about it for self protection and benefit.

Hence, according to *vedic* philosophy, the entire universe is made up of five basic elements-soil, water, fire, air and sky. It is divided into two parts-sentient and non-sentient. Substances are of two types- visible and non- visible. *Prāṇa-śakti*, the subtle form of energy, drives the sentient portion of the visible part. The non-sentient entities contain energy in an inert form.

The fourth basic element, air, surrounds the earth. But its reach is not restricted to earth-it spans entire universe (*dyu-prthivī-antariksa loka-s*). The enveloping substance is called *vāitāvarana*. Together with the other four basic elements (which extend to the whole universe), it is called *paryāvarana*. The related science is called *paryāvarana śāstra*, which can be translated as ecology. Thus, according to *vedic* theory the components of ecology are (i) visible substances like rivers, mountains, trees, shrubs, creepers together with planets, stars, the sun, etc., cohabitants of human beings like birds, animals, reptiles, amphibians, etc., and (ii) the non-visible part like space in which are found bodies, air (charged with the fragrance of flowers and fruits), the fragrance-laden essence of *yajna*, the essence of all other substances, and energy in all forms.

Dynamic equilibrium in the universe:

The universe is vast, and its managing agent is nature. Nature's amazing methods of maintaining balance among the constituents of the universe, which consists not only of the earth, the sun, the solar system or other stars and galaxies,

but also of limitless objects, known and unknown. These are hanging in space, but nature manages to balance them through the tremendous energy, speed, gravitational forces, heat, radiation and so on that it has provided them with. It has given us the sun, the source of energy, and also layers of atmosphere to create a conducive living environment and protect us from harmful radiations and meteoric objects.

G & T Law: The basic formula of nature is the law of give and take (G and T). A continuous process of give and take among the constituents maintains the balance. Since these processes are occurring in nature continuously, the universe is in a state of dynamic equilibrium. In the man-made environment too, the same process must take place. When electricity is consumed in homes and factories, for example, it has to be replenished continuously at the source, which is the powerhouse. The powerhouse in turn takes from a generating station, and the generating station takes its energy from hydraulic or thermal sources and so on.

The main source of such 'giving' in nature is the sun. It gives us energy. According to the Vedic interpretation, the *soma* principle replenishes the energy of the sun, and since the sun continuously receives strength, its energy is not depleted. The *śathapatha-brāhmaṇa* describes the world as a combination of give and take between *agni* and *soma*. This can be understood in another way. The sun has two parts, the photosphere and the chromosphere. It gives light and heat through the photosphere and the chromosphere gives energy to the photosphere. Thus, the sun gives through the photosphere but takes from the chromosphere. The loss occurring due to 'giving' is made good by the equivalent and simultaneous 'taking'. The give and take principle generates a circular or cyclic phenomenon. The processes recur, and nothing new is generated- what is created is through different combinations of the old. Physics also states that matter is neither created nor destroyed- it only changes form. So the process of dynamic equilibrium in nature includes various cycles such as the nitrogen cycle, carbon cycle, weather cycle, and so on.

Mechanism of Nature:

As part of its dynamic equilibrium Nature has its own mechanism for using the waste one entity as nourishment for another. For example, flesh and blood is the food of carnivorous animals, and the leftover rotten flesh and bones are items of feast for scavenger birds. This helps to keep the forests clean and pollution-free. In this way, Nature maintains equilibrium. However, if the limit of nature's self-sustaining measures is crossed, the result is the catastrophic situation we face today. Snakes, for example, are useful for keeping the rat population in check, but by eliminating them (out of human fear) we create problems, and then need to spread pesticides and anti-rodent poisons. Nature's measures are thus disturbed. To avert the calamities that may follow from such interference, something substantial has to be done. We shall shortly see that *yajña* holds great promise in this regards.

The mechanism of dynamic equilibrium through G & T becomes necessary because natural energy sources keep changing form. When energy is in a dormant, unused state, it is not consumed, but when it manifests work gets done. In terms of the laws of physics, when work is done, energy is released. Through their observations and meditation, the *ṛṣi*-s had understood two principles: (1) to get work done, energy has to be invoked (made to manifest), and (11) the resulting depletion in energy has to be replenished through the process of giving 'food' in its essence. This probably gave rise to the principle of '*devattodeśa-dravya-tyāgah*'. Thus, to replenish the depleted energy '*dravya*' is offered to these energies (*devatā*-s) in the form of oblations. The oblations turn in to essence through sacrificial fire and become the food for the energies.

Imbalance among components-pollution:

Pollution is the release of harmful environmental contaminants, or the release of substances in the atmosphere that generate contaminants when they come in

contact with atmospheric elements. When not in accordance with natural corrective processes, this creates an imbalance. This imbalance is, in effect, pollution.

Generally, for a process to be regarded as pollution, it needs to result from human activity. Even relatively benign products of human activity are liable to be regarded as pollution if they precipitate negative effects later on. For example, nitrogen oxides produced by industries are often referred to as pollution because, although the substances themselves are not harmful, sunlight converts them into smog. Thus, the precipitative process also becomes important while defining pollution.

One of the most common forms of pollution is smoke. Smoke is produced due to incomplete combustion of fuels. Most fuels contain carbon, hydrogen, oxygen, nitrogen, and small quantities of sulphur. For complete combustion, a large quantity of oxygen is required. Smoke consists mainly of carbon dioxide, water vapour and carbon particles. It is the biggest air pollutant and very harmful for the heart and lungs.

Effects of imbalance:

Scientists believe that four billion years ago, planet Venus had seas, but due to the extreme increase in its surface temperature, all the water evaporated, and now it is so hot that even lead will melt there. Satellite photographs of Venus support this view. If the temperature of the Earth's atmosphere keeps increasing and the environment continues to be polluted at the current alarming rate, one wonders if the Earth won't meet the same fate one day. Already the effects of the imbalances are showing up in various ways.

Hole in ozone layer:

As explained earlier, the top of the atmosphere contains a layer of ozone gas (24 to 48 km above ground level) This has two major functions with respect to living beings It stops harmful radioactive waves and ultraviolet radiations of the sun It also reflects back the infrared waves that try to rise from the earth In this way, it protects living beings In 1985, scientists observed that a hole has been created in the ozone layer above the South Pole, with the quantity of ozone having been reduced by as much as 20 percent

Scientists believe that certain chemical processes and air pollution, in particular the use of chlorofluoro carbon (CFC), are the main causes of the hole CFC is used in refrigerators, air-conditioning equipment, cosmetics, and even equipment for keeping fast food fresh If the situation continues, it will become difficult to stop the ultraviolet radiations from reaching earth The results could be an increase in cancer, eye tumours, etc Trees and vegetation would also be affected

Disease induced by polluted air:

The industrial use of coal increases the carbon dioxide content in the atmosphere According to a survey of India report, the content of carbon dioxide has increased by 16 percent The use of petrol as a vehicle fuel generates white smoke which contains lead in excess quantities Inhalation of such air causes many lung diseases A traffic policeman standing at traffic square for four hours inhales gastric poison equivalent to that produced by 100 cigarettes Motor vehicles also consume oxygen during fuel combustion The oxygen consumed by a vehicle to travel a distance of 690 km is sufficient for a human being to breathe for one whole year So, while on the one hand the increased number of vehicles has been consuming more oxygen The overall result?, Thick smog in city areas and rise in the earth's temperature

Unhealthy minds:

Polluted and negative mental attitudes also affect the environment. Emotions like envy, hate, greed, anger, etc. and acts of terrorism and violence exert a combined negative effect on ecology. The negative vibrations so created result in stress, stress-induced diseases as well as unhealthy interactions with the rest of the world.

Having seen the causes of pollution and their frightening effects, it can be definitely said that the Vedic advice to follow the righteous path (*rtasya-panthāh*) and Vedic life style based on ritualistic action (*kratvartha-purusāh*) can provide a lasting solution.

Yajña as corrective action:

The *vedas* proclaim in a single voice that the whole cosmos is full of many energy centers. Thus varied centers are pervaded by two cosmic energies as *soma* and *sūrya* अग्नीषोमात्मकमिदं जगत् (शतपथब्राम्हणम्), शिशूः क्रीडतौ परियातो अध्वरम् (तै. ब्रा. २-८-९). These two cosmic energies, cold and hot in nature respectively, cause many cosmic energy centers and cosmic bodies. The above quoted statement metaphorically portrays that this universe is a play ground for two children. As these two children play comfortably, this world becomes a comfortable lodge for all inmates like Gods, men, animals and insects etc. in order to maintain cleanliness, balance and sanctity in this play ground the only means recommended by the sages in *yajña* 'यज्ञेन यज्ञमयजन्त देवाः' ।⁶⁷ सहयज्ञा प्रजास्सृष्ट्वा पुरोवच प्रजापतिः ।⁶⁸ This *yajña* is again classified under five subdivisions viz. देवयज्ञ, पितृयज्ञ, भूतयज्ञ, मनुष्ययज्ञ and ब्रम्हयज्ञ. Whatever activities enlisted elaborately in *dharma-śāstra* are very much eco-

⁶⁷ T A 3 12

⁶⁸ B G 3 10

friendly in nature Any man, irrespective of his nationality, who takes care of others wellbeing maintains his auspicious family tradition, welcomes respected people to his house continuous the traditional knowledge will be performing *yajña* in its real spirit The culmination of this will be manifested in the performance of *dravya-yajña* It is that structured activity elaborately worked out in *brāhmaṇa-grantha-s* and *śrauta-sūtra-s* where energy sources in the cosmos like इन्द्र, अग्नि, वरुण etc will be enriched by offering various types of medicinal sticks and ghee of pure Indian cow progeny As and when these energy centers are energized, they make this world comfortable for all living beings by creating clouds in the atmosphere and enriching earth with healthy medicinal plants Etc This is very well depicted in *raghuvamśa* by *kālidāsa* as-

“दुदोह गा स यज्ञाय सस्याय मघवा दिवम्। रघुवशम्” १-२६

(The emperor *dilīpa* used to satisfy all gods by performing *yajña* In return, those Gods were helping him to make the earth full of wealth In this manner, both men and gods were mutually in collaboration to enrich the whole world)

In the modern context due to many pre-occupied activities, we are forced to limit to some स्मार्तयज्ञ like नवग्रहशान्ति, गणहोम Etc in particular a kind of *homa*, popularly known as *navagraha śanti*, help in many ways in maintaining eco-balance inside and outside the body All nine planets, eight *dikpālaka-s*, thirty three deities, twenty seven stars, twelve *rāśi-s*, are the different names given to different cosmic centers *Yajña* performance facilitates a smooth function of all celestial bodies According to the tradition there are nine types of medicinal plants subscribed to nine celestial trials *śvetārka* is the prescribed medicinal stick for Sun god, and *palāśa* is for the lunar celestial entity It is well experimented and examined that these two have hot and cold effects on the human body respectively If we take up a research work on other holy stick and grains prescribed for the respective celestial bodies, we

come to know that their effects are scientifically well examined and prescribed for performance. At this point, *tantra-śāstra jyotisya* and *āyurveda* are three knowledge sources which closely come forward to guide us. With this insight we have been practicing *yajña*-s supported by *navagraha-vāṭikā* and a pyramid healing centre where many people could increase their brain power with more learning capacity.

Vedic thoughts interpret the entire creation or universe as the outcome of the first-ever *yajña* performed by the lord of creation, *prajāpati*. In this *yajña*, seasons (spring, summer, autumn) supported the sun (in the form of *agni*) by supplying food in the form of energy to replenish it. Thus, the source of energy is in a position to continuously supply energy to the constituents of the universe.

In addition to being the root cause of creation, *yajña*, as the G and T principle, is also responsible for ecological balance in the created universe. This *yajña* is going on in nature without human intervention or support. It helps to keep the five elements pure and in perfect balance with each other. The quality of these elements is very important from the humanistic point of view, because we are not only surrounded by them (in the form of the environment and atmosphere) but also made up of them. Therefore they affect us in more ways than one. If the environment is pure, it leads to peace, prosperity and harmony, but if it is not, negative prevails.

If we were to live in accordance with the principles of nature, and lead an eco-friendly life vis-à-vis the basic five elements, we would have no need to worry about ecological imbalance, depletion of sources, etc. It is estimated that the age of the earth is about 4.6 billion years. If nature has been able to maintain the balance over so many years without external aid, there is no reason to believe that it will not continue to do so in the future as well. No species is known to aid nature externally in maintaining the balance, but no species is found to cross the limits of nature.

either Only human beings, through their ignorance and arrogance, indulge in activities that violate the rules of nature

In the effort to provide an antidote to human excesses, *yajña* should be considered one of the best solutions, if not the only one External of physical *yajña* is a proven method, tested over millennia, to correct the disturbed ecological balance It can be and should be employed by society, if necessary with appropriate alterations to suit modern life (i) to purify atmosphere, (ii) to bring good rain fall, and (iii) to develop positive and healthy minds The first effort is required for good living conditions, the second for abundance, and the third for peace, harmony and spiritual evolution

Role of plants in the *yajña*-s:

Yajña-s are the central focus of this cosmos The divine singer of *bhagavadgītā* i.e lord *kṛṣṇa* too says

सहयज्ञा प्रजासृष्ट्वा पुरोवाचप्रजापति । अनेन प्रसयिष्वध्वम् एष वोऽस्तिवृष्टकामधुक्॥

It means that at the beginning of this *kalpa* (creation) Brahma after creating *Yajña*-s, living beings etc advised them to propagate via the medium of *yajña*-s because these *yajña*-s will fulfill your material/spiritual needs *Yajña*-s are those extremely precious boons given to world humanity by Vedic *ṛṣi*-s of ancient India which is a foundation stone of material/spiritual bliss and maintaining a healthy ecosystem (especially today when world leaders are worried about environmental pollution and global warming)

Today the air we breathe in is loaded with harmful gases like NO², CO, which are all above the standards prescribed by the government and are extremely harmful for human health All the new scientific methods or chemicals being used today to kill bacteria have the side effects on environment and human health Best

example is the use of DDT, one of the best known synthetic pesticides. DDT has now been declared toxic for humans and environment. Even chlorination of water has the side effects if used regularly and in large amounts. Liquids used in mosquito repellent are also harmful to human health to some extent.

With the development of the modern science we are getting more dependent on synthetic chemicals to kill bacteria or remove pollution other than the use of natural sources like medicinal plants or energy like Sun. In our ancient days people used the natural sources to fight the bacteria and pollution.

From time immemorial, human beings have used smoke of medicinal plants for curing disorders. Smoke produced from natural substances has been used extensively in many cultures and famous ancient physicians have described and recommended such use. According to old concept in *hindu-ism* the basis of life has been said to be food. The basis of food is earth. The basis of earth is water and the basis of water is air. If air will be pure, all elements of the chain will become pure, thus purifying and cleansing life itself. For the environmental problem, the *hindus* in the earlier days used the *vedic* science of *yajña* or *Yajña* is the term for a sacred purifying ritual in *hindu-ism* that involves a fire ceremony. It is a ritual of sacrifice made to the fire god *agni*. After lighting a *yajña-kunda* (sacrificial fire), objects such as fruits, honey, or wooden goods are put into the sacred fire. The main purpose of a *yajña* is for the purification of our surroundings. It is a person's duty to thank nature for balancing our surroundings and making them fit for human existence.

Yajña is a very important science. The fuel used from various trees to light the *yajña* fire is imbued with special qualities. For which disease which herb is used? All this has a strong scientific basis. When certain materials are united the resultant admixture possesses a special quality which when exposed to fire rises up in the atmosphere so as to detoxify and de-pollute it. Further when Vedic *mantras* are chanted simultaneously the influence on the atmosphere is that much more

potently positive. Thus not only is air pollution taken care of but that individuals nearby *yajña*-s benefit health wise both physically and mentally. How do we describe demigods? They are nothing but various subtle powers at work in the deep cave of subtle nature or *prakṛti*. What is the meaning of appeasing demigods? The answer is it is the establishment of a good wholesome rapport with these subtle forces of nature. This goal can be easily fulfilled via performing of *yajña*-s.

Among the *yajña*-s, *dravya-yajña* helps to spread spiritual electric currents in subtle space and thus vile mental taints like hatred, sins, selfish desires, criminality, hard heartedness etc are destroyed. The cascading result seen will be in the form of many problems getting solved. Various problems like mental complexes, stress, fear, tension, worry, anxiety and dire possibilities can be warded off. In ancient times Kings, wealthy class *ṛṣi*-s conducted gigantic *yajña*-s and as a result the atmosphere in a very widespread area became sacred and pure. In addition national, international and social evils were rooted out completely. The laymen householders performed *yajña*-s on a smaller scale which helped solve their family and village problems in a big way. For widespread joy, peace, rains, wealth, sound health etc gigantic *yajña*-s were required. And yet small *yajña*-s carried out by laymen certainly helped solve their day to day problems maybe in a bit of a limited manner. If we compare the cost of conducting *yajña*-s know for sure that the benefits both material and spiritual are a thousand fold more and this is not an overstatement. Thus it is crystal clear that *yajña*-s can never put us into a loss but is a clear win-win situation.

In the thesis I have also made an attempt to conduct the study on the scientific experiments on the plants used in *yajña*-s. A research report says that, a scientist named Trelle of France did experiments on *yajña*-s. He found that *yajña*-s is mainly performed by using mango tree (*Mangifera indica*). When the wood is burnt then a gas, 'formic aldehyde' comes out which destroys the harmful bacteria.

and makes the atmosphere purified. Then only, the scientists made 'formalin' from 'formic aldehyde' gas. He also did experiment on jaggery, *gudam* (in *sanskṛta* raw sugar) and found that on burning the jaggery, jaggery also generates 'formic aldehyde' gas. A scientist named Tautik came to know that if we stay in a *yajña* and if its smoke can be consumed for half an hour then the germs of typhoid is destroyed as all these matters are used in *yajña*. Yajurveda says that four types of things mainly used to prepare offerings for a *yajña* - 1 Sweet Like honey, jaggery, raw sugar etc, 2 Antibiotic herbs like ghol, mango, neem, tulsi etc, 3 Nutrition like pure ghee, dry fruits etc, 4 Fragrant materials like elachi (cardamom) dried petals flowers etc.

It's quite evident that mango is very auspicious tree for *Hindus*. All most all Indian rituals and festivals require a mango leafs and twigs for purification and decoration.

Seeing the importance of *yajña* scientists of the National Botanical Research Institute in Lucknow India, decided to test whether *yajña* smoke affected indoor air quality. They burned *yajña* ingredients- the mixture of aromatic medicinal herbs like *palāśa* (*Butea monosperma*), *nyagrodha* (*Ficus unidca*) Etc, typically prescribed for *Hindu* rituals in a closed room. They found smoke from the material did kill germs.

Research claims that there was no reduction in the number of airborne bacteria when one kg of mango wood was burnt. But when half a kg of *yajña* ingredients was added to it, the bacterial count reduced by 94 per cent within one hour. Report also claims that the bactericidal effect did not diminish as soon as the source of smoke was removed. The researchers sampled air quality over 24 hours, after which the room was opened. Even at the end of the duration, the bacteria count was 96 per cent lower. Repeated sampling showed the effect lingered for a month. The study was published in Journal of Ethnopharmacology (December 3, 2007). It

was demonstrated that using medicinal smoke it is possible to completely eliminate diverse plant and human pathogenic bacteria of the air within confined space, says the report

Scientists warn that if the fumes of the *yajña* can kill bacteria it can also affect the human health. So detailed chemical analysis of gradients used in the *yajña* should be done.

The following example further illustrates the scientific benefits of medicinal plants used in *yajña*.

Bhopal (Madhya Pradesh, India) Gas Tragedy and *agnihotra* The tragic incident occurred on the night of December 3, 1984 when the poisonous MIC gas leaked from Union Carbide factory at Bhopal. Hundreds of people died and thousands were hospitalized, but there were two families – those of Shri Sohan Lal S. Khushwaha and Shri M. L. Rathore, living about one mile away from the plant, who came out unscathed. These families were regularly performing *agnihotra*, wherein medicinal plant twigs, incorporated with ghee and other material, given to the fire as ‘āhuti’ (offerings). In these families nobody died, nobody was even hospitalized despite being present in the area worst affected by the leakage of the toxic gas. This observation implies that *agnihotra* is a proven antidote to pollution.⁶⁹

Apart from these *yajña*-s methods some plants are having direct impact on atmosphere and human body. One such verity is neem tree, (*Azadirachta Indica*). Neem has an incredible curative and protective power. Neem plays an important role in the region's religious traditions as well as in the *āyurveda* healing system.

⁶⁹ English Daily – ‘The Hindu’ of 4th May 1985, news item under the heading ‘Vedic Way to Beat Pollution’

According to ancient myths, Indra - the king of Celestials - bestowed neem with its incredible power while returning to heaven on a sacred white elephant after retrieving a golden pot of ambrosia from the demons. He spilled the ambrosia on a neem, making it a tree blessed with virtuous qualities that could remove all diseases. In another story, insects are said to be the creation of evil demons, and neem protects people from them by weakening the insect's life patterns.

Most *yajña* implements are also made from wood although some are made from metal and a few from rock/stone/soil. The *brāhmanagrantha-s* enlist the trees, called *yajña*-trees (*yajña-vrksa*), that can be used to make the sacrifice related implements and vessels.

The table gives the names of trees that are acceptable for making *samit* and *yajña* implements. However, according to *purāṇa-s*, a few trees such as tamarind, jackfruit and Babul are forbidden to be used in a *yajña*. Even acceptable trees covered with creepers or infested with maggots, larva, etc. or containing birds' nests are omitted.

There are very specific rules for making the vessels and other implements. The type of tree from which the wood must be drawn, where such a tree should be planted and when it should be cut are some of the details mentioned in the *brāhmaṇa* texts. Even the kind of person eligible to make the implements and when should they undertake the task have been given due thought and recorded. It is mandatory for all associated with a *yajña* to follow these guidelines. Detailed knowledge of these aspects is absolutely necessary for a *yajña* to be successful in terms of the desired outcome.

The description of *yajña-pātrām*, their form and figure, intended use, classification, etc. given here are taken from the *śathapatha-brāhmaṇa*. There could be marginal variations between this and other texts like the *aittareya* and *taittirīya*.

brāhmanas However, they may be of relevance only to an in-depth researcher For a beginner who just wants to get a feel for the subject, it may not matter as such variations are not 180 degrees apart

Fumigating substances used in yajña:

There are two basic energy systems in the physical world heat and sound In performing *yajña*, these two energies, namely, the heat from *yajña*'s fire and the sound of the chanting of the *vedic mantras*, are blended together to achieve the desired physical, psychological and spiritual benefits

The fumigation, vaporization and sublimation of specific substances in the *yajña*-fire constitute a verifiable scientific method of sublimation of matter and expansion of its colloidal state generates ions and energy with positive effects in the surrounding atmosphere through the specific sonic waves of the mantras

In order to get an idea of the various chemical changes that take place during the performance of *yajña*, it is essential to know the various substances used and offered in the *yajña* -fire These can be broadly classified into two types wood (*samut*), and a mixture of odoriferous and medicinal herbs (*yajña-sāmagrī*)

Wood has to be dry and free from dust, insects and worms The wood is cut into small sticks of varying lengths called *samut* -s according to the size of the altar or *agni-kunda*

The *yajña-sāmagrī* should be prepared with a proper combination of the following odoriferous substances These are usually saffron, musk, agar, tagar, sandalwood powder, cardamom, nutmeg, javitri and camphor, Substances with Healing properties clarified butter (ghee), milk, fruits, lin seeds, and cereals like wheat, rice, barley, various millet, gram, peas, etc, Sweet Substances sugar, dried dates, resin, honey, Etc Medicinal herbs are used as per the specific requirements

Some commonly used herbs are *Tinospora cordifolia* (tinospóra/guduchi or giloya), *Bacopa Monieri* (bacopa or bíáhmí), *Convolvulus Pluricaulis* (shankh pushpi), *Mesua Ferrea* (cobía's saffron or nágkesar), *Glycyrrhiza Glabra* Bois (liquoric root or mulhati), Red Sandalwood, *Terminalia Bellirica* (beddanut or bahedá), Dry Ginger, and *Terminalia Chebula* (chebulic myrobalans or harada) Different combinations of these and/or other special herbs are used for the treatment of specific diseases through *yajña*-therapy

Products of Combustion:

The interpretation of the process of combustion in a *yajña* on a scientific basis is rather difficult due to the following reasons (i) The properties of substances, which are used here vary, (ii) The conditions under which combustion takes place inside the *yajña* -fire are very sensitive to the shape of the *kunda* and the type, quantity and arrangement of wood etc, (iii) the variation in the temperature and thermodynamic effects is quite significant from the top to the bottom of the *kunda* and it also depends upon the shape and size of the latter The products of combustion depend on the factors like — (a) The nature of substances used and their proportions, (b) Temperature attained, (c) Controlled supply of air and (d) Interaction amongst the various products formed

Distillation of woods:

Besides the complete combustion of the cellulose material of wood, it is also subjected to distillation This happens due to the way *samit*-s are arranged in the *kunda* (also called *yajña kunda*) and the levels of temperature and air supply which prevail in it

Vaporization of Odorous Substances:

The temperature attained by the *kunda* varies between 250°C and 600°C, while in the actual flames it can rise as high as 1200°C to 1300°C. At their boiling points, the volatile constituents vaporize and their gaseous forms get diffused. Also, when cellulose and other carbohydrates undergo combustion, steam is formed in copious quantities by the combination of the hydrogen of the decomposed organic molecules with the oxygen. This is how the substances like thymol, eugenol, pinene, terpinol etc., are dispersed to in the surroundings and the aroma of a *yajña* can be smelt at a considerable distance.

In addition to steam, smoke is emitted in large quantities and solid particles existing in a decomposed state offer sufficient scope for its diffusion. Thus smoke also functions as a colloidal vehicle for the spreading of volatile aromatic substances. This process depends on the inside and surrounding temperature and on the direction of the wind.

Combustion of Fatty Substances:

The fatty substances used in *yajña* are mainly ghee and other fatty substances of vegetable origin. Ghee helps in rapid combustion of cellulose of wood and keeps the fire alight. All fatty substances used are combinations of fatty acids, which volatilize easily. The combustion of glycerol portion gives acetone bodies, pyruvic aldehyde and glyoxal etc. The hydrocarbons produced in the reactions again undergo slow combustion and as a result methyl and ethyl alcohols, formaldehyde, acetaldehyde, formic acid and acetic acids are formed.

Photochemical Process:

The vaporized products diffused in the atmosphere are also subjected to photochemical reactions in the sunlight. They undergo photochemical

decomposition, oxidation and reduction reactions From an environmental angle, the reduction of CO² caused by *yajña* as explained above and the liberation of oxygen cannot be overemphasized Similar kinds of other useful reactions take place in the presence of specific radiations from the sunrays This may be perhaps the reason it has been recommended that *yajña* should be performed during sunlight

Fumigation Wood treatment:

इह प्र ब्रूहि यतम सो अग्ने यो यातुधानो य इद कृणोति ।

तमा रभस्व समिधा यविष्ठ नृचक्षसश्चक्षुषे रन्ध्रयैनम् ॥⁷⁰

Inspect and identify wooden materials which are liable to get damaged by undesirable pests (white ants, termite etc) Subject the wooden material to *agnihotra* fumes to reach these wood damaging organisms and destroy them to make the wooden materials acceptable on inspection (Wood treatment by in special process for fumigation is a very standard modern technique)

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तीक्ष्णेनाग्ने चक्षुषा रक्ष यज्ञ प्राञ्च वसुभ्य प्र णय प्रचेत ।

हिंस्र रक्षास्यभि शोशुचान मा त्वा दभन्यातुधाना नृचक्ष ॥⁷¹

Sharpened vision strategy of regularly performed *agnihotra* (with *mantras* and medicinal *havi*), directly attacks the enemies (the infections) and strengthens the positive healthy elements in life

नृचक्षा रक्ष परि पश्य विक्षु तस्य त्रीणि प्रति शृणीह्यग्रा ।

तस्याग्ने पृष्टीर्हरसा शृणीहि त्रेधा मूल यातुधानस्य वृश्च ॥⁷²

⁷⁰ R V 10 87 8, A V 8 3 8

⁷¹ R V 10 87 9, A V 8 3 9

⁷² R V 10 87 10, A V 8 3 10

Agnihotra ensures well being of all They traverse the environment to keep a watch over the three types of harmful germs and destroy these three types of germs by appropriate three methods (According to modern science the germs are broadly classified in to three types based on their shapes and behavior 1 Bacteria is from ‘bacillus’ Latin word for ‘little rod’ like shapes 2 Spherical bunch grape like shapes growing in chains are called ‘Staphylococcus’ 3 Flagellate germs that have a self propelling flagellate at one end)

त्रिर्यातुधानो प्रसिति त एत्वृत यो अग्ने अनृतेन हन्ति ।

तमर्चिषा स्फूर्जयजातवेदो समक्षमेन गृणतेनि वृद्धि ॥⁷³

These three types of disease causing pain giving organisms come under your grips again and again But *homa* provides continuous protection to regular performer of *agnihotras*, by destroying these germs

तदग्ने चक्षु प्रति धेहि रेभे शफारुज येन पश्यसि यातुधानम् ।

अथर्ववयोतिषा दैव्येन सत्य धूर्वन्तर्मचित न्योष ॥⁷⁴

Agnihotra with their divine powers destroy the obvious/ visibly perceptible enemies of honest simple life style, like even the polluted earth- in soil on which cows dig with their hoof

यदग्ने अद्य मिथुना शपातो यद्वाचस्तृष्ट जनयन्त रेभा ।

मन्योर्मनसो शरब्वा जायते या तया विध्य हृदये यातुधानान् ॥⁷⁵

⁷³ R V 10 87 11, A V 8 3 11

⁷⁴ R V 10 87 12, A V 8 3 21

⁷⁵ R V 10 87 13, A V 8 3 12

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When the performers of Agnihotra are expressing their anger in chanting mantras against enemies of the community, their anger should impel you to destroy those harmful elements

परा शृणीहि तपसा यातुधानान् पराग्रे रक्ष हरसा शृणीहि ।

परार्चिषा मूरदेवाञ्छृणीहि परासुतृपो अभि शोशुचानो ॥⁷⁶

Agnihotra kills those that take delight in causing disease. Agnihotra performer is also got rid of depressive mind and is blessed with a cheerful disposition

पराद्य देवा वृजिन शृणन्तु प्रत्यगेन शपथा यन्तु तृष्टा ।

वाचास्तेन शरव ऋच्छन्तु मर्मन् विश्वस्यैतु प्रसिति यातुधान ॥⁷⁷

(*Agnihotra*) Empower the noble well behaved persons to defeat the criminals Criminals should perish by the same means that they want to employ to destroy a civil society Destroy by hitting at the vital spots of the liars who steal public money

यो पौरुषेयेण क्रविषा समक्ते यो अश्व्येन पशुना यातुधान ।

यो अघ्न्याया भरति क्षीरमग्रे तेषा शीर्षाणि हरसापि वृश्च ॥⁷⁸

Those who fill their belly by starving people, those who live by stealing horse feed, those who steal milk of cows, they should be eliminated by strong actions (Regular performers of Agnihotra develop the temperaments of “Manyu” and there by destroy the enemies of society)

⁷⁶ R V 10 87 14, A V 8 3 13

⁷⁷ R V 10 87 15, A V 8 3 14

⁷⁸ R V 10 87 16, A V 8 3 15

सवत्सरीण पय उस्त्रियायास्तस्य माशीद्यातुधानो नृचक्ष ।

पीयूषमग्रे यतमस्तितृप्सात् त प्रत्यञ्चमर्चिषा विध्य मर्मन् ॥⁷⁹

Cows provide throughout the year, year after year, the milk ambrosia for you to satiate yourself Do not allow the harmful organisms to consume it Pierce those contending demons in their vital parts to destroy them with flames (Pasteurization of milk with plasma is the most modern innovation in milk technologies)

विष गवा यातुधाना पिबन्त्वा वृश्च्यन्तामदितये दुरेवा ।

परैनान् देवो सविता ददातु परा भागमोषधीना जयन्ताम् ॥⁸⁰

Let the demons drink poison from the cows (This indicates the biocidal properties of cow products milk, ghee, urine and cow dung) Let the demons hard to overcome be cut to pieces for the sake of growing good food and herbs that have nutritious and medicinal qualities (This is reference to cutting up cow dung and exposing it to sun to destroy the eggs of horn flies and other harmful organism , before vermicompost for use in Organic fertilizers)

सनादग्रे मृणसि यातुधानान् न त्वा रक्षासि पृतनासु जिग्यु ।

अनु दह सहमूरान् क्रव्यादो मा ते हेत्या मुक्षत दैव्याया ॥ RV10 87 19 AV8 3 18

Agnihotra have always destroyed the enemies' disease carrying germs in the environments *Agnihotra* should be performed in such a manner that it succeeds in completely destroying these infections (This has reference to the scale and size of *agnihotra* performances to match the scale and size of the objectives)

⁷⁹ R V 10 87 17, A V 8 3 17

⁸⁰ R V 10 87 18, A V 8 3 16

त्व नो अग्ने अधरादुदक्तात् त्व पश्चादुत रक्षा पुरस्तात् ।

प्रति ते ते अजरासस्तपिष्ठा अघशस शोशुचतो दहन्तु ॥⁸¹

Agnihotra should be adequate to destroy all the infections on all sides from top to bottom and from front to our back

पश्चात् पुरस्तादधरादुदक्तात् कवि काव्येन परि पाहि राजन् ।

सखे सखायमजरो जरिम्णेऽग्ने मर्तो अमर्त्यस्त्व न ॥⁸²

The institution of *agnihotra* provides protection from all sides This institution of *agnihotra* is an everlasting immortal procedure that provides as a friend protection to mortals

परि त्वाग्ने पुर वय विप्र सहस्य धीमहि ।

धृषद्वर्ण दिवेदिवे हन्तार भगुरावताम् ॥⁸³

Wise men perform yajnas to obtain from *agnihotras* all-round protection of their powerful blinding irradiance *Agnihotra* are providers of bounties by always destroying our enemies

विषेण भगुरावत प्रति ष्म रक्षसो दह ।

अग्ने तिग्मेन शोचिषा तपुरग्राभिर्ऋष्टिभि ॥⁸⁴

Powerful, intense flames of *agnihotra* turn to ashes all those indulging in demonical behavior

⁸¹ R V 10 87 20, A V 8 3 19

⁸² R V 10 87 21, A V 8 3 20

⁸³ R V 10 87 22, A V 8 3 22

⁸⁴ R V 10 87 23, A V 8 3 23

प्रत्यग्ने मिथुना दह यातुधाना किमीदिना ।

स त्वा शिशामि जागृह्यदब्ध विप्र मन्मभि ॥⁸⁵

Duality of indecision –to be or not to be- is acting like an enemy of life
Create the wisdom in our temperaments (by *agnihotra* and *vedic* education) to have
clear vision for leading a healthy life

प्रत्यग्ने हरसा हर शृणीहि विश्वत प्रति ।

यातुधानस्य रक्षसो बल वि रुज वीर्यम् ॥⁸⁶

Agnihotra and *vedic* wisdom empower to destroy the demonical enemies
from our life (both in our minds the ill thoughts and disease organisms in the
physical environments)

विषेण भङ्गुरावत प्रति स्म रक्षसो जहि ।

अग्ने तिग्मेनशोचिषा तपुग्राभिरर्चभि ॥⁸⁷

Agnihotra overpowers and destroys by its powerful flames the enemy
organisms that promote unhealthy life

वि ज्योतिषा बृहता भात्यग्निराविर्विश्वानि कृणुते महित्वा ।

प्रादेवीर्माया सहते दुरेवा शिशीते शृङ्गे रक्षभ्यो विनिक्ष्वे ॥⁸⁸

The largest source of illumination sun with its vast resource is also
performing the actions to destroy diseases by its rays that come in slanting and
straight manner (This has a clear reference to UVB –Ultra Violet B in the slant
morning and evening sun rays as source of Vitamin D and IR-Infra Red rays for
solar pasteurization)

⁸⁵ R V 10 87 24

⁸⁶ R V 10 87 25, A V 13 2 22

⁸⁷ A V 8 3 23

⁸⁸ A V 8 3 24

ये ते शृङ्गे अजरे जातवेद स्तिग्महेती भ्रह्मसशिते ।

ताभ्या दुर्हार्दमभिदासन्त किमीदिन प्रत्यञ्चमर्चिषा जतवेदो वि निक्ष्व ॥⁸⁹

The two horns –the direct heat of flames and radiated energy never get old and lose their effectiveness to destroy our enemies In fact they become more deeply penetrating & forceful by the mantras that are chanted simultaneously

अग्नी रक्षासि सेधति शुक्रशोचिरमर्त्य । शुचि पावक ईड्य ॥⁹⁰

White flames of the *agnihotra* also make the entire environment clean and pure white

Role of CO² Generated in *yajña*:

The wood and fossil burning in atmosphere is always controversial because of the generation of carbon monoxide and carbon dioxide and a consequent increase in the ‘green house’ effect On this basis it can be argued that *yajña* also produces CO and CO² It should be noted here that the way in which the *samit*-s are burnt in *yajña* is a process of slow combustion It is not comparable to the burning of coal in the factories or household fire or running of steam engines etc, where oxygen is sucked in large quantities and CO² is emitted likewise In the slow combustion process that takes place in yagna, a small quantity of O² is utilized and CO² is emitted in a quantity that poses no threat to the environment In fact whatever CO² is generated is readily absorbed by the surrounding plant life and vegetation and thus the CO² cycle is strengthened

Another important fact to be noted is that CO² produced in *yajña* is not free CO² It is mixed with the vapors of other aromatic oils and antiseptic products It acts as a vehicle in transporting such products to the surroundings

⁸⁹ A V 8 3 25

⁹⁰ A V 8 3 26

The use of CO² as a cerebral stimulant to assist patients suffering from lack of ventilation is a common practice in the medical field. Its use in controlling and curing many mental disorders is also known to medical science. Small amounts of CO² inhaled by the persons performing *yajña* act as a stimulant for inhaling more and more aromatic fumes which helps in curing mental disorders.

Some of the earliest writings known to man focus on medicinal herbs and the healing properties of plants. The Vedas, the oldest of the *hindu* sacred texts and the basis of the *āyurveda* tradition, detail the use of neem as a medicinal herb. *Bṛhat samhitā*, the ancient text written by *varāhamihira* (505 AD) and sometimes called "the encyclopedia of Indian Culture, includes a chapter on medicinal herbs that highly recommends neem.

Thousands of years later, neem still plays an important role in healthcare and religion in many Indian households to such a degree that it's almost "cradle-to-grave" healthcare insurance. For instance, families often bathe new-born babies in water that has been boiled with neem leaves because of its medicinal and refreshing qualities. In South India, when a mother leaves a baby unattended, she often leaves a small twig of neem leaves near the baby for protection. Thousands of Indians use neem twigs to brush their teeth every day (a tradition recognized by the Indian subsidiary of international giant Unilever that created neem-based toothpaste).

Another ritual called the *aśvatthanārayanapūjā* is used by couples who want to conceive a child. They perform a marriage of neem and the banyan tree and go around these seven times every morning for seven days.

In yet another myth, the sun god *sūrya* is said to have been sought refuge from demons in a neem tree. That tradition is reflected in a belief among some *hindus* that anyone who plants three neem trees lives after death in *sūryaloka* (Sun World) for three epochs and never goes to hell. The neem tree has the capacity to

prevent the evil spirits entering from its surroundings Hence still in India *Hindus* possess neem tree before their dwelling places

At funerals (*maranottaravidhi*), the *purāna*-s urge that family and friends chew neem leaves to protect against lingering infections, and spread more leaves at the threshold of the house where the death occurred - a tradition based on neem's healing powers and dating back to the days when many people died in epidemics It is also seen in India that in order to avoid mosquitoes and flies neem smoke will be generated by putting neem leaves in to the fire

Today's generation demands visible proof based on sound scientific research If we fail to test spiritual principles with apt scientific experimentation people will continue to gaze at them atheistically Today because our ancient spiritual sciences are looked upon skeptically man is forgoing all material and spiritual benefits attained by imbibing spiritual precepts Hence many research institutes use very scientific modern technology and apparatus in its hi-fi laboratory With its help we can get sound evidence to one and all which will then encourage world humanity to imbibe a spiritual vision via spiritual endeavors This great responsibility of scientifically proving the priceless nature of spiritual sciences is being handed over to great modern scientists and gifted upcoming young spiritual thinkers

Thus all above mentioned evidences and activities crystal clearly proclaim that Indian medicinal plants are having gigantic purifying and healing effects on the atmosphere and human body The main idea behind the performance of *yajña* in Indian tradition is "Heal the atmosphere and it will heal you" Hence *yajña* is a scientific process of purification of the atmosphere with the agency of cosmic element –fire and medicinal plants, it creates pure nutritional and medicinal atmosphere and prevents growth of pathogenic bacteria The subtle vibrations emanating from it creates & fills the surroundings with love, peace and purity The

atmosphere improves family relationship, health of children by causing a soothing calming effect on them

Clean air is a gift of nature. The *vedas* attach high importance to clean environment. The *rgveda* says, 'Air in its pure form is the best medicine, leading to peace of mind, good health and long life. If a house is without a treasure of pure air, it is not worth living in. O *vāyu*, by bestowing a small part of your nectar-like wealth, gives us long life'⁹¹

The treasure referred to this oxygen. *Yajña* purifies the air (*vāyu shodhaka*) and makes it sacred. Purification of the air is achieved through oblations. According to the *yajurveda*, *yajña* is developed so it becomes (i) a purifying process to clean the environment based on a scientific approach, and (ii) a destroyer of disease-spreading germs and viruses from the point of view of medical science.

A physical *yajña* (*smānta* or *śrauta*) like *agnihotra* or *soma-yāga* is performed with simultaneous actions at two levels. *Mantras* are chanted and oblations offered to *agni-devatā*. The *mantras* generate a desirable anti-polluting effect through the appropriate sound waves. *Havi-dravya* such as *ājya* and other fragrant materials with air purifying, anti-disease and nourishing qualities are poured in to the well-lit fire, kindled by sticks from trees with special medicinal qualities.

The oblations are consumed by the fire to produce their essence. The *yajña-agni* spreads the essence in all directions the medium of air. According to the *atharvaveda*, *havi-dravya* works like medicine to provide a soothing effect for maladies.⁹² According to the *rgveda*, organization of *yajña* in this manner makes it

⁹¹ वात आ वातु भेषज शशु मयोभु नो हृदे। प्र ण आयूषि तारिषत्॥ उत वात पितासि न उत भ्रातोत न सखा। स नो जीवतवे कृधि॥ यददो वात ते गृहे मृतस्य निधिर्हित । ततो नो देहि जीवसे॥ ^{R V 10 136 1 3}

⁹² उत् सूर्यो दिव एति पुरो रक्षासि निजूर्वन। आदित्य पर्वतेभ्यो विश्वदृष्टो अदृष्टहा ^{A V 6 21}

possible to remove every atmospheric impurity. The proposition that air is purified by *yajña* and such purified air helps to bestow physical health is also supported by *rcas* in *sāmaveda* and *atharvaveda* which pray for the proper application of the *dravya* and destruction of the enemies of health⁹³

Agnihotra is a unique technique established by our ancient seers for welfare of humanity and environments. But this act is to be performed on a daily basis and hence it is more unique and special. Aging of human body and impairment of environment are an inevitable part of life. Every individual should look after his health and heal the inadvertent damage caused to the environment. *Agnihotra* was conceived with this end and prescribed as duty of every individual. When performed as a daily ritual it is also referred to as *homa*. Little realizing its scientific basis, *agnihotra* got linked as a *Hindu* ritual. But it is a matter of great satisfaction that in the last decade worldwide movements by dedicated Europeans have established *homa* as a secular procedure for improving health of humans and the environments. Regular *homa* is being performed in nations around the world. North South Americas, Germany, Poland etc. to name a few.

Agnihotras are classified into mainly three types. Brief ritual performed twice daily is *homa*. Performed on large community festivals and occasions is a *yajña*. Religious ceremonies for a specific purpose are performed with a *yajña*. *Agnihotra* is the only proven alternative to chemical fumigation for dealing with air borne pests as told earlier. But other than *agnihotra* so far no known methods are available for purification of atmospheric air and deal with biological pollutants such as viruses, bacteria, etc. It has been found effective against atomic radiations also. In controlled scientific researches, it has been established that *agnihotra* not only purifies polluted air but also prevents pollution. For maximum effectiveness *agnihotra* should be done at exact sunrise and sunset times. These are the transition

⁹³ मुञ्चासि त्वा हविषा जीवनाय कमज्ञातयश्मादुत राजयश्मात्। ग्राहिर्यग्राह यद्येतदेनम् तस्या इन्द्राग्निं प्र मुमुक्तमेनम्^{AV 3.11.1}

points of circadian rhythm. Modern science has found that rate of growth of stem cells is sensitive to the transition points of the circadian rhythm. Marked fluctuations in engraftment capacity in bone marrow are seen at different points of circadian rhythm. Thus *agnihotra* performed at these transition times of sunset and sunrise has life enhancing quality for human body and the environments. Regularly performed *agnihotra* has demonstrated healing powers against hitherto incurable diseases such as down syndrome, epilepsy, diabetes etc, that have direct relation with inner human body systems and are unapproachable with invasive or medicinal interventions. In the field of horticulture great improvements in productivity, flavor and taste have been reported in cultivation of fruits such as grapes, apples, and mangoes. It is matter of great satisfaction that Indian horticulture scientists have been working very closely with our farmers on these projects. *Agnihotra* is to be performed in copper vessel of inverted pyramid shape that acts as an antenna for radiating positive energy in to the environment. As told earlier, ingredients offered in the fire in *agnihotra* are of three categories- Pure cow's ghee, medicinal nutritive sweets, herbs/grains and aromatic substances. Specified wood and dried cow dung patties are used as fuel for burning in these rituals. All these chosen ingredients are found to be based on very sound scientific and medicinal basis. Cow's pure ghee is confirmed to enhance the effectiveness of the medicinal curative properties of *Agnihotra*. The cathartic power of the medicinal substances is enhanced several times and the benefit is derived by several persons who happen to inhale these vapors/ gases. It is ironic that in India apart from preserving the traditional procedures to perform very elaborate *yajñas*, little knowledge about significance of the procedures exist. After spending time to witness a great *yajña* in south India, Frits Staal, a great western scholar was led to write a book "*Rituals and Mantras Rules Without Meanings*". It is a matter of satisfaction that modern generations of Indian researchers have been exploring the scientific secrets of *agnihotra* the great innovation of the Indian seers.

To substantiate the above passages the *vedas* will be resorted to-

द्यावाहक्षामाप्रथमेऋतेनाऽभिश्चावेभवत्

सत्यवाचा। देवो यन्मर्तान्यजथायकृण्वन्त्सीदधदोताप्रत्यङ्स्वमसुयन्॥⁹⁴

In the beginning when almighty desired to become many and made this creation, He empowered the humans with wisdom and ability to perform *agnihotra*

देवो देवान्परिभूऋतेन वहानो हव्यप्रथमश्चिकित्वान्।

धूमकेतु समिधाभाऋजीको मन्द्रो होतानित्योवाचायजीयान्॥⁹⁵

Firstly fuel, secondly clarified butter and finally oblations that are offered in to the fire in *agnihotra* secure the environment, and at the same time chanting of *veda mantras* elevate the spirits of the *agnihotra* performer

स्वावृग्देवस्यामृतयदीगोरतोजाता सोधारयन्त उर्वी।

विश्वे देवा अनुतत्तेयजुर्गुह्ये देनी दिव्यघृतवा ॥⁹⁶

By protecting and serving the cows, atonement of all trespasses is secured, the entire Earth is enriched and, milk and clarified butter of the cows provide divine bounties on earth

अर्चामिवावर्धयापो घृतसूद्यावाभूमी शृणुतरोदसीमे।

अहायद्द्यावोऽसुनीतिमयन्मध्वानो अत्र पितरा शिशीताम्॥⁹⁷

⁹⁴ R V 10 12 1, A V 18 1 29

⁹⁵ R V 10 12 2, A V 18 1 30

⁹⁶ R V 10 12 3, A V 18 1 32

⁹⁷ R V 10 12 4, A V 18 1 31

Agnihotra performed with *mantras* brings about healthy change in the atmospheric water (moisture and rains) and soil to give higher agriculture produce with sweeter taste

(Experimental *agnihotra* researches on agriculture have confirmed this phenomenon in India and abroad Modern science has also confirmed that such organic agriculture produces sweeter – higher-brix number- food)

किस्विन्नो राजा जगृहे कदस्यातिव्रतचक्रमाको विवेद।
मित्रश्चिद्धिदमा जुहुराणो देवाञ्छलोकानयातामपि वाजो अस्ति॥⁹⁸

Keep Nature satisfied by following the practice of Agnihotra accompanied with chanting of mantras, in order that Nature blesses you with all the sweet bounties sought by you

तस्य नामसलक्ष्माय द्विषुरूपा भवति।
यमस्य यो मनवते सुमन्त्वग्नेतमृष्वपाह्यप्रयुच्छन्॥⁹⁹

He who does not appreciate this system of nature(that Agnihotra is complimentary to maintaining balance in Nature to regularly favor humans with by providing all the bounties) , suffers in life like ordinary mortals

दुर्मन्त्रत्रामृतस्य नामसलक्ष्माय द्विषुरूपा भवति।
यमस्य यो मनवते सुमन्त्वग्नेतमृष्वपाह्यप्रयुच्छन्॥¹⁰⁰

⁹⁸ R V 10 12 5 , A V 18 1 33

⁹⁹ R V 10 11 6

¹⁰⁰ A V 18 1 34

Sun and moon constantly engage in providing all the bounties of nature
Agnihotra in similar manner helps in providing humans with similar bounties

यस्मिन्देवाविदथेमादयन्तेविवस्वत सद्नेधारयन्ते।

सूर्येज्योतिरदधुर्मास्यक्तून्परिद्योतनिचरतरजस्रा॥¹⁰¹

The secretly performed actions of *devatās* such as *mitra*, *aditi*, *savitā*, and *varuna* are not visible, but the impact of their actions is apparent in the bounties of nature

श्रुधीनोअग्नेसद्नेसधस्थेयुक्ष्वारथममृतस्यद्रवितुम्।

आनोवहरोदसीदेवपुत्रेमाकिर्देवानामपभूरिहस्या ॥¹⁰²

Agnihotra performed at home, in *yajñasālā*, or in public gatherings, by bringing the presiding *devatās*, brings the bounties of nature close to us

Further in the *vedas* a special hymn by name *raksohāgnih* deals with obtaining protection from agents that cause pain, disease and destruction of healthy life and community. It can be interpreted at different levels. Our enemies can be germs carrying diseases in the environments, and can be treated by *agnihotra*. Enemies of society can also be criminals, thieves, saboteurs, black marketers, smugglers, adulterators, from which society has to be protected by joint actions of community and law enforcement by ruling forces.

रक्षोह्ण वाजिनमा जिघर्मि मित्र प्रथिष्ठमुप यामि शर्म ।

¹⁰¹ R V 10 11 7, A V 18 1 35

¹⁰² R V 10 12 9, A V 18 1 25

शिशानो अग्निं क्रतुभिः समिधदः स नो दिवा स रिष धातु नक्तम् ॥¹⁰³

Homa strengthened by offerings of ghee etc destroys all negative elements unfriendly to our life Homa fires on being fed by wood etc gain sharpness to proved protection all time-day and night

अयोदष्टो अर्चिषा यातुधानानुप स्पृश जातवेदः समिधदः ।

आ जिह्वया मूरदेवान् रभस्व क्रव्यादो वृक्त्व्यपि धत्स्वासन् ॥¹⁰⁴

The offerings in the fire by its contact reduce the disease causing germs to ashes This is as if the Agnihotra provides steel teeth in their jaws to chew away 'flesh eaters' and a tongue to digest the flesh eating enemies

ओ शण्डामर्का उपवीर शौडिकेय उलूखल ।

मलिम्लुचो द्रोणासश्च्यवनो नश्यतादितः स्वाहा ॥ इदं शण्डादिभ्य इदं मम् ॥¹⁰⁵

ओ आलिखन्ननिमिषः किंवदन्त उपश्रुति ।

हर्यक्षः कुम्भीशत्रु पात्रपाणिर्नृमणिर्हन्त्रीमुखः सर्षपारुणश्च्यवनो नश्यतादितः स्वाहा ॥

इदमालिखन्ननिमिषाय किंवदद्भ्य उपश्रुतये हर्यक्षाय कुम्भीशत्रवे पात्रपाणये नृमणये हन्त्रीमुखाय सर्षपारुणाय च्यवनाय, इदं मम् ॥¹⁰⁶

शण्डामर्का - are names given to two demons They have killer habits and are from the family of bacilli such as found in milk curds etc being of organic origins- उपवीर शौडिकेय with abilities to cause physical pains discomfort to the उलूखल the

¹⁰³ R V 10 87 1

¹⁰⁴ R V 10 87 2

¹⁰⁵ R V 1 16 23

¹⁰⁶ R V 1 16 23

bacteria being very small in size as if ground and mixed together in a pestle with mortar मलिम्लुचो disease caused by contagion associated with lack of hygiene द्रोणासश्च्यवनो objects entering with breath through nose (manifesting as colds and coughs in the initial stages), नश्यतादित and causing debility to the body of this new born may get destroyed इदं शण्डादिभ्य इदं न मम This offering in the fire is for them and not for me आलिखन्ननिमिष causing invisible scratches /coatings /injuries (insect bites) किवदन्त inimical to children (those without teeth) उपश्रुति said to be demons, हर्यक्ष depriving eyesight कुम्भीशत्रु enemies of both the eye cavities पात्रपाणिर्नृ as if seeking alms with both hands मणिर्हन्त्रीमुख as if with mouths wide open to kill/destroy सर्षपारुणश्च्यवनो of different colors नश्यतादित may get destroyed and thrown away)

Agnihotra changes the temperaments:

उभोभयाविन्नुप धेहि दष्टा हिंस शिशानोऽवर पर च ।

उतान्तरिक्षे परि याहि राजञ्जभै स धेह्यभि यातुधानान् ॥¹⁰⁷

The fire in *agnihotra* - *homa* has two rows of teeth These are sharpened by strong intense fires of *agnihotra* , to march radiantly to reach far wide and high to crush the two enemies शिशानोऽवर पर च desires and anger at non fulfilling of the desires from our temperament in life there उतान्तरिक्षे परि याहि राजञ्जभै स धेह्यभि यातुधानान्- The *agnihotra* is also to establish on the horizon of our temperaments the

¹⁰⁷ R V 10 87 3, A V 8 3 3

habit of constantly engaging in constructive activities that prevent negative self destructive /depression in our life

यज्ञैरिषू सनममानो अग्ने वाचा शल्यो अशनिभिर्दिहान् ।

ताभिर्विध्य हृदये यातुधानान् प्रतीचो बाहून् प्रति भङ्ग्येषाम् ॥ 108

The arrows and javelins of fire get directed and motivated by *mantras* recited loudly accompanying the fires of *agnihotra*

अग्ने त्वच्च यातुधानस्य भिन्धि हिंसाशनिर्हरसा हन्त्वेनम् ।

प्र पर्वाणि जातवेदो शृणीहि क्रव्यात्क्रविष्णुर्वि चिनोतु वृक्णम् ॥ 109

Oh fire of *agnihotra* percolate in to the skin of sufferers from skin disease
Select all the germs that eat in to the flesh and destroy every one of them

यत्रेदानी पश्यसि जातवेदस्तिष्ठन्तमग्र उत वा चरन्तम् ।

यद्वान्तरिक्षे पथिभि पतन्त तमस्ता विध्य शर्वा शिशानो ॥ 110

Agnihotra flames (and gases) travel far and wide in to the atmosphere and wherever in the environments they see a disease carrying organism they direct their arrows to destroy them

यज्ञैरिषु सनममानो अग्ने वाचा शल्या अशनिभिर्दाहान् ।

विध्य हृदये यातुधानान् प्रतीचो बाहून् प्रति भङ्ग्येषाम् ॥ 111

¹⁰⁸ R V 10 87 4, A V 8 3 6

¹⁰⁹ R V 10 87 5, A V 8 3 4

¹¹⁰ R V 10 87 6, A V 8 3 5

Mantras chanted with *agnihotra* further sharpen the arrows and coat them with medicines (of *havi*) which the enemies are destroyed by *agnihotra*

उतालब्ध स्पृणुहि जातवेद आलेभानादृष्टिभिर्यातुधानात् ।

अग्ने पूर्वो नि जहि शोशुचान आमाद द्विकास्तमदन्त्वेनी ॥ ¹¹²

Science of oblation:

The oblations are offered when the *adhvaryu* says ‘*swāha*’ The second wave created by the word and conversion of *havi-dravya* in to essence makes the fire rise high in the air ¹¹³ The repetition of ‘*swāha*’ and the pouring of oblations create a cyclic action, giving rise to a wave pattern Therefore, to strengthen the wave pattern it is recommended that everyone present in the *yajña- mantapa* utters ‘*swāha*’ along with the *adhvaryu*

In *agnihotra homa*, oblations are offered at sun rise and sunset The same *havi-dravya* is used on both occasions, but mantas are different The morning offering generates air-purifying vapours that progressively rise in the air as it becomes hot with the ascending sun They keep cleaning and filtering the air, thus nullifying the polluting agents The essence of the evening offerings does not rise high due to the comparatively higher percentage of smoke in the air and the lower atmospheric temperature They barely rise to one-fourth of the morning essence or half a kilometer high However, they help to stop the polluting agents (which would have risen in the air during the day) from descending to the lower strata of atmosphere near the ground In other words, they produce a kind of protective umbrella It is observed that the area affected (positively) by one *agnihotra* or *homa* can extend up to an area of even 20 sq km

¹¹¹ A V 8 3 6

¹¹² R V 10 87 7, A V 8 3 7

¹¹³ Y V 6 16

Concept of good rain:

Yajña helps to balance nature, harmonizing the seasons and regularizing the natural cycles. A given state of nature and its related forces may be altered and re-directed through the power of *yajña*, but not by transgressing natural laws. The process of *yajna* requires the fullest use of human potential to achieve an end-result, but this is attempted by working with Nature, not against it. This is possibly the major difference between modern science and Vedic science too. Vedic rain induction technology is one example, though a very important one, of how natural can be turned to our advantage through *yajña*, instead of trying to bring them under our control.

That the heat of the sun lifts the water on earth to the atmosphere, which after sometime comes down as rain was recognized by the *ṛsis* at a very early stage. They conceived the rainfall process as a *yajña*, taking place in the middle region (*antriksa*) and the rain drops were supposed to impregnate the earth as a result of which life comes upon the earth. The rain god *parjanya* (rain bearing cloud), who is closely linked with *indra* in his main function of producing rain is described as a bull, who roars and impregnates the plants by depositing his *vīrya* (semen).

The sixth *sūkta* of the first *mandala* of *ṛgveda* contains some concepts on rainfall process. The *kārīṣṭi* describes in the *taṭtirīya samhita* of *yajurveda* has many interesting statements containing the concepts of vedic- *ṛsis* on the rainfall process.

Artificial rain making: Modern science and vedas

Science tells us nothing can be created from nothing. For making any rains it is necessary to have water bearing clouds. Till recently the phenomenon of precipitation of clouds was considered only on basis of physical sciences, and

artificial rain making experiments were made with solid dry ice to initiate precipitation. But now with developments in biotechnology the role played by microorganisms in rain making is getting to be noticed. Discovery of the role of bacteria such as *Pseudomonas Syringe* in nucleation of ice at higher temperatures opens the possibility that these bacteria can facilitate precipitation from water bearing clouds at the prevailing temperature. These bacteria are found profusely in green and rotting leaves at the ground levels. These bacteria are also known to spread very widely in the atmosphere and reach cloud heights on their own. At cloud levels they cause nucleation of ice at the prevailing cloud temperatures, and this induces the clouds to release rains. In absence of these bacteria clouds will have to travel to far colder higher mountainous regions to cause precipitation if any, and thus bypass many areas that were used to experience good rains in the past.

This microbiological phenomenon, to initiate precipitation of rains is described by the scientists in the report given below.

Man in his pursuit for urbanization has drastically reduced the green cover on ground. On hills to conserve forests for discouraging cattle for grazing and humans from getting firewood, planting of Pine trees has been promoted. The naturally growing '*banjh*' *Quercus* family – a dual purpose leaf fodder and firewood tree has been gradually replaced with planting of Pine trees. Pine needle fallen from the trees smother the green undergrowth by mulching. This results in total loss of green undergrowth on the Himalayas. The rain inducing bacteria *Pseudomonas Syringae* get eliminated from the environment. This is resulting in turning our green Himalayas into deserts without rains. The root system of the green undergrowth also plays a very important role of soil stabilization. This in turn prevents soil erosion, landslides and floods in the hilly areas.

Although vegetative cover is known to help rain precipitation, but absence of these microorganisms in thin vegetations could be an explanation for monsoon clouds bypassing certain green areas. The semiarid and arid regions having thin vegetation remain dry in spite of the fact that monsoon clouds pass over these areas.

There are enumerable references in *vedas* to artificial rain making activities and specific *yāgas* are described to promote rains. *Yāgas* can only be the facilitators for inducing the water bearing clouds to release the rains. Even some past experiments by scientists in India could not establish a positive result of *yāgas*, (more due to our lack of scientific insights). In presence of widely present vegetation the environments could be rich with rain inducing microbes. *Yāgas* performed in such environments could facilitate the transport of these microbes to higher cloud level altitudes and induce precipitation.

This makes it very easy to understand the scientific wisdom of the following *veda mantra* from *1 rgveda*

त्यं चिद् घा दीर्घं पृथुं मिहो नपातम मृधम् ! प्र च्यावयान्ति यामाभिः¹¹⁴

Before them, on the ways they go, they drop this offspring of the cloud, long, broad, and inexhaustible

(It is important to bear in mind that according to modern science of microbiology, the entire universe is pervaded by microbes. All life science phenomena is progressively being conceived to be caused by actions initiated by microbial populations. In Vedas 'Maruts' मरुत are what modern science describes as microbes. Winds, Atmosphere, Rhizosphere, Biosphere every physical reality is permeated by Microbes. This in turn is precisely the case with Maruts as described in Vedas.)

¹¹⁴ R V 1 37 11

Recorded impact of plants utilized in yajña:

Many experiments have been conducted in India and abroad to study the plants and herbs used in *yajña* and its effects. These experiments have tested the effects from various perspectives and parameters. Some recorded instances of the positive effects of plants used in *yajña* are described below.

In a research study by Gurukul Kangri University Haridwar, India, an exercise was conducted specifically to measure the effect of *smārta-agnihotra-yajña* on the surrounding atmosphere. The parameters under observation were physical (temperature, odour, respiratory suspended particulate matter, suspended particulate matter), chemical (nitrogen oxide, nitrogen dioxide, other nitrogen oxides, sulphur dioxide, carbon dioxide, ozone content) and microbiological (bacteria count). It was found that after the *yajña*, the atmosphere was almost totally free of all chemical parameters considered to be harmful. Physical parameters also showed a distinct reduction and the bacteria count came down from 860 to 70¹.

The research also pointed out that *yajña* consumes minimal oxygen. *Yajña* wood has fast burning property, especially *palasa* (*Butea monosperma*), *nyagrodha* (*Ficus bengalensis*), *asvattha* (*Ficus religiosa*), *udumbara* (*Ficus glomerata*)¹¹⁵ i.e. it creates very little combustion resulting in ash. So the intake of oxygen from the atmosphere and the release of carbon dioxide are proportionately low too. This is one reason why the essence that emanates from a *yajna* does not induce discomfort (unlike normal smoke) but is extremely refreshing. It is also stated in *śubhāsita* that *homa-dhūma* (sacrifice smoke) is good for our longevity¹¹⁶.

A group of scientists led by Dr. Manoj Garg, Director, Environmental and Technical Consultants in association with the experts from the Uttar Pradesh

¹¹⁵ शमी-पलाश-न्यग्रोध-प्लक्षवैकन्कतोद्भवा । अश्वत्थोदुम्बरौ विल्वचन्दनसरलस्तथा ॥ Unknown

¹¹⁶ सन्ध्यार्को होमधूमश्च बालास्त्री निर्मलोदकम् । रात्रौ क्षीरान् भुक्तिश्च आयुर्वृद्धिर्दिने दिने ॥ *subhāsita* : *atna bhāndāgāra*

Pollution Control Board had conducted experiments during the *aśvamedha-yajña* at Gorakhpur, U P. These experiments were set up at about 20 meters east of the *yajñashālā*. The samples of 100 ml each of water and air collected from the surroundings were analyzed, using high volume Envirotech APM-45 and other sensitive instruments for testing water and air pollution. A summary of their results as reported in *akhand jyoti*, Sept '97 p 22,¹¹⁷ showed an average reduction by 75% in the level of Sulphur-Dioxide and about 10% in Nitrus-Oxide, and Over 70% reduction in bacteria in water samples in the surrounding area. Several medicinal minerals were present in the ash (*bhasma*) of *yajña*. The average level of Carbon-monoxide was found reduced from 117 p p m to 0 in some of the experiments conducted on domestic *yajñas* at IIT Bombay (unpublished results). There are some more ongoing experiments on recording different gas levels and respirable particles are currently ongoing, being conducted by some visiting scientists at *brahmavarchas* Research Center of *gāyatrī tīrtha*, *śāntikuñj*, *haridvār*.

The Brahmavarchas Research Centre was established by Pandit Shriram Sharma Acharya in 1979. It is situated at the Sapta Sarovar road about 6 kilometers from the Hardwar railway station in the direction of Rishikesh, in India. This centre is actively working for the integration of the modern and ancient sciences. Innovative scientific research work is being carried out here in the science of spirituality. Apart from a dedicated team of scientists, doctors and engineers and other scholars of high caliber and well equipped laboratories for relevant research in different scientific disciplines including neurology, biochemistry, haematology, phytochemistry and sound therapy etc, other features of attraction here are collections of about 450 herbs which include some rare species of the Himalayan herbs.

¹¹⁷ Akhand Jyoti (Aug '84, July & Aug '92, March '93, Sept '97) Publisher, Akhand Jyoti Sansthan, Mathura.

The Ayurvedic (herbal medicine) lab of this centre and its pharmaceutical unit have produced new herbal medicines that have shown superb healing results in some cases of nervous system disorders, asthma, heart diseases, diabetes, lung infections, a wide variety of skin diseases and the diseases of the eyes and ears. Tens of thousands of patients benefit every year from the free consultancy and pure herbal medicines available at no-profit prices here. The lab studies the properties and effects of these herbs when sublimated in the fire of *yajña*.

The laboratory has a *havana- kunda* placed in a glass chamber and a gas analysis wing for the collection and analysis of the fumes and vapors of *yajna*. The efficacy of various herbal ingredients in the *havis* and the quality of the *samit* are assessed in the phytochemistry lab, which is equipped with units like the gas-liquid chromatograph. The purpose is to analyze the raw content in the beginning and what is left after these substances have been fumigated.

Blood samples are kept in the glass chamber when it is full of the fumes and vapors during the daily *yajña* (*havan*) and the changes in the blood biochemistry and haematological parameters are recorded for these samples.

A large number of experiments are carried out on random samples of healthy and diseased persons, living on the Shantikunj and Brahmavarchas campuses for prescribed periods. The subjects include the *sādhakas* as well as the non- *sādhakas* of all age groups (both men and women) from all walks of life irrespective of their social or religious background. During such experiments, the subjects are asked to sit in the glass chamber and inhale the fumes of *yajña* for specific periods of time. A thorough analysis of their bodies and minds is made before and after performing this experiment.

The measurements (carried out by chromatographs, multi-channel physiographs, etc) of the above experiments include – haematological parameters like Hb, TRBC, TWBC, Platelets, RBC fragility etc, biochemical changes like those in the levels of blood urea, sugar, cholesterol, creatinine, SGOT, SGPT etc, and the

immunological changes like the antibody levels and innate immunity towards various pathogenic offending organisms

The EEG, EMG and ECG recordings are carried out in the neurophysiology labs. The psychometry lab assesses the aptitude, learning potential, memory, the intelligence quotient, emotional quotient and the overall personality makeup of the subjects. The cases are followed upon at regular intervals (e.g. after performing yajna regularly for a week, or a month etc.) These experiments may be extended, in collaboration with some neurochemists, to also record the levels of various hormones like cortisol, thyroxin, ACTH, androgens etc. in the endocrinology lab.

The general conclusion of the results obtained so far is that performing yajña significantly enhances the vitality and resistance against adverse metro-biological changes and against the invasion of otherwise lethal viruses and bacteria. Mental peace, emotional stability and creative development of the mind are the general observations of the analysis on the psychological fronts.

Some Case Studies on Results of Research in Scientific Laboratories:

In his study Dr. Selvamurthy has observed neurophysiological effects of the mantras of a special kind of agnihotra, which is performed at the time of sunrise and sunset. In this experimental study eight healthy men were chosen as subjects. They reported on two consecutive days. First day was for control recording when rituals of agnihotra were performed but instead of the prescribed mantras, some irrelevant syllables were uttered at specific time periods. Next day the agnihotra was performed with proper mantras. Recording of physiological parameters viz. heartbeat rate, ECG lead-II, blood pressure etc. were made on both days. The results showed that while the mind (brain waves) remained unaltered during the first day agnihotra, significant changes occurred after the proper agnihotra, these included – (a) GSR remained significantly higher during the proper agnihotra, (b) ECG

showed DC shift in the base line, (c) EEG showed alpha enhancement and delta suppression for more than 15 minutes

Diabetic Treatment: The urine sugar level of some acute diabetic patients was found to be totally absent and the level of blood sugar was reduced to normal just after two to three weeks of daily agnihotra

Relief from Drug Addictions: An officer of 25 years age who had been a poly drug abuser in the past was selected for the study by Lt Col G R Golecha, a senior advisor in the psychiatry division of the Indian army. The patient was at that time addicted to heroin for 2 years. He had undergone some de-addiction courses twice in the past with no benefit and had become de-motivated and resistant to such methods. He was then introduced to agnihotra. The practice of *agnihotra* resulted in improving his motivation to abstain from smack and showed significant decrease in his urge for it within a few weeks.

Newer Directions: In the recent years, the established healing therapies have begun to recognize the role of psychology in prevention and cure of diseases of different kinds. As the atmosphere, *prāna* and mind are interlinked, the individuals naturally experience relaxation, peace, quieting of the mind, loss of worries and stress in the *yajña* atmosphere. The increase in the level of *prāna* (vital energy) in the atmosphere when a *yajña* is performed – was also recorded with the help of Kirilian photographs of human hands before and after *yajña* in the experiments conducted by Dr Matthias Ferbinger of Germany.

The atmosphere surrounding the place where a *yajña* (or agnihotra) is being performed and the ash produced in the *kunda* are suffused with energetic currents and soothing and uplifting ambience.

Further scientific research and large scale experiments on the potentials of *yajña* will help make it a distinct, alternative therapy of far-reaching benefits to humanity at large and open up newer directions for constructive integration of the modern and the ancient sciences.

Through above discussion some light is thrown on the awareness of our ancient seers about the environment, and its constituents. It is clear that the *vedic* vision to live in harmony with environment was not merely physical but was far wider and much comprehensive. The *vedic* people desired to live a life of hundred years and this wish can be fulfilled only when environment will be unpolluted, clean and peaceful. The knowledge of *vedic* sciences is meant to save the human beings from falling into an utter darkness of ignorance. The unity in diversity is the message of *vedic* physical and metaphysical sciences. Essence of the environmental studies in the *vedas* can be put here by quoting a partial *mantra* of the *īśāvāsyaopaniṣad* - 'One should enjoy with renouncing or giving up others part. *Vedic* message is clear that environment belongs to all living beings, so it needs protection by all, for the welfare of all. Thus the study proves the origin of environmental studies from the *vedas*.

Chapter 3

Amarakośa as a source of Indian Botany

Introduction:

Comprehension of any language involves and is facilitated by mastering its vocabulary, grammar and literature. Since mastering the vocabulary is a daunting task, in mother tongue our vocabulary is enriched by practice. But for assimilating other languages some means of remembering is required, either by studying the literature of that language or versification of words with their meaning. Versification has been successfully accomplished in Sanskrit. Sanskrit scholars quote lexicons such as *amarakośa*, *vaijayanī* etc. while commenting on any Sanskrit text as authorities for different shades of meaning of such words. The Sanskrit lexicon most widely used by all is *amara's nāmalingānuśāsanam*.

Many erudite scholars such as *ksīrasvāmī*, *bhāmujidīksita* and many other stalwarts in this field have with all studiousness commented upon it. The *nighantu* is the oldest lexicographical literature in Sanskrit which is mainly intended to help the interpretation of *vedic* texts. The *nighantus* confined themselves to the *vedas* which contained not only nominal forms but also verbal ones whereas the *kośas* dealt with words in classical literature and restricted themselves to the nominal forms and the indeclinables. The above mentioned quality is one striking feature between the *nighantus* and *kośas*. The *nāmalingānuśāsana*, the most referred, celebrated, authentic and authoritative ancient thesaurus of Sanskrit, authored by *amarasimha* is considered as a quintessential pre-requisite for a Sanskrit scholar of any measure and any degree. It is concise, comprehensive and most profusely used lexicon in Sanskrit. The *amarakośa* (dictionary of *amara*) or *nāmalingānuśāsana* is a thesaurus of Sanskrit written by *Amarasimha*. The word *amara* means “immortal” and *kośa* means “treasure, casket, pail, collection, dictionary”. Thus the word *amarakośa* literally means “Immortal Treasure”. But contextually it means the

dictionary of *amara* or a dictionary authored by *amara*. Its alternative name *nāmaṅgānuśāsana* literally means “instructions for deciding the genders of nouns”. It is also known as *trikāṇḍa* as it contains three *kandas*. *Amarakośa* is also known as *paryāyakośa* or a dictionary of synonymous words. *Amarakośa* is prepared most scientifically and is comprehensive in all respects. Sanskrit *kośas* were mainly of two types. Some of the *kośas* dealt with nominal words while others were developed for explaining the gender. The former is known as *nāmaṅgānuśāsana* and the latter is *lingamātratantra*. But *amarasimha* combined both the styles and methods in his dictionary. *Amarasimha* mentions his work as *nāmaṅgānuśāsana* in this *śloka*

समाहृत्यान्यतन्त्राणि संक्षिप्तैः प्रतिसंस्कृतैः सम्पूर्णमुच्यते वर्गैः नामलिङ्गानुशासनम्

Amarasimha - the author of Amarakośa:

Amarasimha, the renowned scholar, is the author of the ancient lexicon *Amarakośa*, which is clear from the colophon

इत्यमरसहकृतौ नामलिङ्गानुशासने स्वरादिकाण्ड प्रथम साङ्ग एव समर्थित ॥

This is the only information about *Amarasimha* that we get from *amarakośa*. He hasn't mentioned any information about himself anywhere in *amarakośa*. *Amarasimha* was considered as a well-known poet. The following *śloka* reveals his poetic proficiency

प्रयोगव्युत्पत्तौ प्रतिपदविशेषार्थकथने प्रसक्तौ गाम्भीर्ये रसवती च काव्यार्थरचने

अगम्यामन्यैर्दिशिपरिणतेरर्थवर्चसोर्मतम् चेदस्माकम् कविरमरसिंहो विजयते ॥

It describes the usefulness and derivations of a word. The word ‘*kavi*’ in the fourth *pāda* reveals his fame as a poet. The construction of the first *śloka* of *amarakośa* shows his Excellency in poetry. *Mallinātha* calls *amarasimha* ‘*kavi*’ in the last verse of his commentary on *amarakośa*. He also says that the immortality of

nāmalingānuśāsana is assured as this faultless work will last as long as the moon and the stars shine in the sky

कवेरमरसंहस्य कृतिरेषा सुनिमर्ला। आचन्द्रार्क स्थेयान्नामिलङ्गानुशासनम्॥

Amarasimha was a good grammarian He is counted as one of the eight grammarians It was stated in the *kavikanthābharana*

इन्द्रश्चन्द्र. काशकृत्त्रापिशली शाकटायन.। पाणिन्यमरजैनेन्द्रः जयन्त्यष्टौ हि शाब्दिकाः ॥

There is a popular humorous saying that *amarasimha* robbed all the authoritative interpretations of *patañjali's mahābhāṣya*

अमरसहो हि पापीयान् सर्वम् भाष्यमचूचुरत्।

This shows the thorough mastery of *amarasimha* in grammar *Amarasimha* was the son of *śabarasvāmī* and his mother was a *śūdra* lady

ब्राह्मण्यामभवद्वराहमिहिरो ज्योतिर्विदामग्रणी राजा भर्तृहरिरश्च विक्रमनृपो क्षत्रात्मजायामभूत्। वैश्यायां हरिचन्द्र वैद्यतिलको जातश्च शंकुः कृती शूद्रायाममरः षडेव शबरस्वामिद्विजस्यात्मजाः ॥

Some scholars conclude that *amarasimha* was a Buddhist Following arguments help in arriving at this decision

1 In the *mangalaśloka*

यस्य ज्ञानदयासिन्धोरघादस्यानघागुणाः। सेव्यतामक्षयो धीराः स श्रियै चामृताय च ॥

The word *jñānadayāsindhuh* is very much suitable for *Buddha*

2 He started the synonyms of *devatā* with the synonyms of *Buddha* In *nānārthavarga* also *Buddha* is mentioned If these arguments are accepted, then the following is a counter argument for the above But the word *jñānadayāsindhuh* can keep as a simile of any God like *Viṣṇu* or *Śiva* or *rāma* or *kṛṣṇa* If he was a

Buddhist then he would have mentioned about *Bauddhasanghas*. Some scholars opined that he was a follower of Jaina as *amarasimha* mentioned *dharmarājau jinayamau* as the synonym of *Jaina*. Nothing apart from his works is known with certainty about the religion of *amarasimha*. He neither mentioned about *buddhasangha's* nor *jainasangha's*. It clears that he did not belong to any of these two. The major part of his work discusses *varnātmakavyavasthā* and *yajñasamsthā* and so on. It is very clear from the *Amarakośa* that he had deep knowledge of *śruti*, *smṛti*, *purāṇa*, *itihāsa*, *darśana* and so on. Some sources indicate that *amarasimha* was one of the ‘gem’ in ‘Navaratnas’ (nine gems) at the court of the king *vikramāditya* of 7th century, following *kālidāsa's jyotiṛvidābharanam*.

धन्वन्तरिः क्षपणकामरिसंहशंकु वेतालभट्टघटखपरकालिदासा ।

ख्यातो वराहिमिहरो नृपतेः सभाया रत्ननी वैवरुचिर्नर्विवर्कर्मस्य ॥

In the *jyotiṛvidābharanam* the courtiers of *vikramāditya* are

शङ्ख सुवाग्वरुचिर्मणिंरंशुदतो जिष्णुस्त्रिस्तोचनहरी घटकपर्करख्यः ।

अन्येऽपि सिन्त कवयोऽमरिसहपूवा यस्येह विकर्मनृपस्य सभासदोऽमी ॥

Textual Organization:

The *amarakośa* consists of verses which can be easily memorized. Most of the verses are written in *anustup* meter. Even though it is a dictionary of synonymous words, a section called *nānārthavarga* has homonymous word too. The words in *nānārthavarga* are arranged as per the ending such as *kānta* (words ending with 'ka'), *khānta* (words ending with 'kha') and so on. Like other Sanskrit texts, *amarakośa* also begins with a *mangalaśloka*.

यस्य ज्ञानदयामिन्धोरघादस्यानघागुणा । सेव्यतामक्षयो धीराः स श्रियै चामृताय च ॥

But he doesn't mention any God's name in his *mangalaśloka*. After *mangalaśloka* he brings up some special rules, which are meta-rules useful to understand the gender information of a word (see the chapter “Gender information in *amarakośa*”). *Amarakośa* is divided into three *kāndas*. *Kāndas* are further subdivided into “*vargas*”. The first *kānda* has words pertaining to gods, heaven *pañcamahābhūta* (five basic elements) and abstract concepts such as *dik* (direction), *kāla* (time), *vāk*, etc. This chapter has ten “*vargas*”. The second *kānda* deals with the words denoting real physical objects such as earth, human beings, animals, plants etc. This chapter also has ten “*vargas*”. The third *kānda* has words related to grammar description of polysemous words and other miscellaneous words, and has five “*vargas*”.

Statistics:

Statistics of *Amarakośa* is given below. Names of each *varga*, verse details in each *varga*, word number in each *varga* etc. are described.

Kāndas:

Prathamakānda, *dvitīyakānda* and *trītyakānda* are the three *kāndas*.

Vargas:

Vargas from each *kānda* are named thus.

Prathamakānda:

Svargavargah (heaven)

Vyomavargah (sky)

Digvargah (direction)

Kālavargah (time)

Dhīvargah (cognition)

Śabdādivargah (sound)

Nātyavargah (drama)

Pātālabhogivargah (nether world)

Narakavargah (hell)

Vārivargah (water)

Dvītiyakānda:

Bhūmivargah (earth)

Puravargah (towns or Cities)

Śailavargah (mountains)

Vanausadhivargah (forests and medicines)

Śimhādivargah (lions and other animals)

Manusyavargah (mankind)

Brahmavargah (priest tribe)

Ksatriyavargah (military tribe)

Vaiśyavargah (business tribe)

Śūdravargah (mixed classes)

Trtīyakānda:

Viśeṣyaṅghnavargah (adjective)

Samkīrtnavargah (miscellaneous)

Nānāīthavargah (polysemous)

Avyayavargah (indeclinables)

Līṅgādisangrahavargah (gender)

Śloka:

Śloka in *amarakośa* can normally be classified according to their nature, in three classes viz *sāmānyaśloka*, *niyamaśloka* and *praksiptaśloka*. *Sāmānyaśloka* are main verses, which contain synonymous words, and their meaning *Niyamaśloka* describe the meta language and *praksiptaśloka* are the verses which are inserted later by others. To decide whether a śloka is *praksipta* or not, we follow the commentary by *Bhānujī Dīkṣita*, named *Sudhāvyākhyā* or *Rāmāśramī* edited by

Pandit Śivadatta in 1915 If the śloka is not there in these commentaries, it is considered as *praksiptaśloka*

The First Kāṇḍa

उक्तं स्वव्योर्मिदकालधीशब्दा दि सनाद्यकम्। पातालभोगि नरक वारि चैषा च सगतम्।।

The first kāṇḍa contains *svargavargah* (heaven), *vyomavargah* (sky), *digvargah* (direction), *kālavargah* (time), *dhīvargah* (cognition), *śabdādivargah* (sound), *nāṭyavargah* (drama), *pātālabhogivargah* (nether world), *narakavargah* (hell), and *vārivargah* (water)

Varga contents

• Svargavargah

Heaven, Gods, Demons, their arms, ornaments, symbols or vehicles, and other attributes, Fire, Air, Velocity, Eternity, etc

• Vyomavargah

Sky

• Digvargah

Directions, Deities of the directions, elephants at the points, their female elephants, Cloud, thunder, lightning, rainbow, Rain, hail, rainy day, cloudy day, Moon, types of light, frost, Stars, Planets, sunset, dawn, sunlight, etc

• Kālavargah

Time, day, night, variations of the moon, eclipse, second, hour, months, year, Weather, seasons, Happy, Sorrow, Soul, Mind, etc

• Dhīvargah

Individuality, consciousness, knowledge, sense, organs, tastes, fragrance, colours, etc

• **Śabdādivargaḥ**

Sarasvatī, voice, word, Vedas, Vedāṅgas, stories, legends, sound, types of sounds, speech, musical sounds, song, ornament's sound, etc

• **Nāṭyavargaḥ**

Seven musical tones, Musical Instruments, dance, theatrical characters, sentiments, desire, affection, kindness, Festival etc

• **Pātālabhogivargaḥ**

Infernal region, hole, darkness, Snakes, kinds of serpent, parts of snake, etc

• **Narakavargaḥ**

Hell, various hells, departed souls, pain, etc

• **Vārivargaḥ**

Water, Ocean, wave, whirlpool, shore, channel, island, boat, voyage, pilot, deep, fish, fisherman, net, fish basket, hook, etc , types of fishes, Aquatic animals, crab, turtle, etc Well, pond, types of ponds, River, Names of rivers, water plants, lotus, water lilly, etc Parts of these plants etc

The Second Kānda

वर्गाः पृथ्वीपुरक्षमाभृद्रौषध मृगादिभिः ।

नृबह्वर्क्षतर्विट् शूद्रैस्साङ्गोपाङ्गैः रहोदिताः ।

It is divided into ten *vargas* or parts They are *bhūmivargah* (earth), *puravargah* (towns or cities), *śailavargah* (mountains), *vanausadhivargah* (forests and medicines), *simhādivargah* (lions and other animals), *manusyavargah* (mankind), *brahmavargah* (priest tribe), *ksatriyavargah* (military tribe), *vaiśyavargah* (business tribe) and *śūdravargah* (mixed class)

Varga contents

• Bhūmivargaḥ

Earth, land, soil, clay, world, India, regions, types of lands, country, village, kingdom, hill, road,

• Puravargaḥ

City, suburb, Market, fort, wall, house, kinds of houses, parts of house, house holdings, building land, etc

• Śailavargaḥ

Mountains, kinds of mountains, parts of mountains, caves, etc

• Vanaśādhivargaḥ

Forest, garden, tree, parts of tree, flowers, fruits, leaf, shrub, creeper, names of trees, names of shrubs, names of creepers, names of grass, etc

• Śimhādivargaḥ

Animals, lion, tiger, wolf, deer, kinds of deers, etc Insects, bee, cricket, birds, hawk, skylark, crow, parrot, etc parts of birds, wing, beak, etc

• Manuṣyavargaḥ

Man, woman, descriptions of woman, blood-relations like son, daughter, husband, wife etc , manhood, different stages of manhood, parts of our body, diseases such as cough, scab, etc , dress, ornaments, cloths, types of cloths, cosmetics, fragrant plants, sandal etc , hair decoration styles, daily usable things etc

• Brahnavargaḥ

Tribes, religious states, sacerdotal, scholars, characters and descriptions of priests, their occupations and observances, types of fires, sacrifice, its requisites, alms, worship, austerity, study, hypocrisy, marriage, human, pursuits and objects etc

• Kṣatriyavargaḥ

Military tribe, kings, ministers, officers, servants, enemies, allies, requisites of government, means of defence, and of success, revenue, foresight, insignia of

royalty, army, elephants, parts and kind of elephants, horses, types of horses, vehicles, chariots, litters, warriors, arms and weapons, bow, arrow, javelin etc war, slaughter, funeral, prison, life, etc

- **Vaiśyavargah**

Third tribe, professions, husbandman, field, implements of husbandry, corn, pulse, oil-seeds, granary, kitchen, vessels, prepared food, dairy, cattle, traffic, weights and measures, commodities, etc

- **Śūdravargah**

Fourth tribe, mixed classes, artisans, jugglers, dancers, musician, hunters, servants, barbarians, dogs, hogs, theft, nets, fops, loom, plot for burden, wrought leather, tools, art, images, wages, spirituous gaming, etc

The Third Kāṇḍa

विशेष्यनिघ्नैस्सङ्कीर्णैर्नानार्थैर्व्ययैरपि।

लिङ्गादिसङ्गर्हैर्वर्गार्ः सामान्ये वर्गस्यार्ः।।

Viśeṣyanighnavargah (adjective), *sankīrnavargah* (miscellaneous), *nānāarthavargah* (polysemous), *avyayavargah* (indeclinables), *lingādisangrahavargah* (gender) The third *kāṇḍa* contains adjectives, verbs, words related to prayer and business etc

Varga contents

- **Viśeṣyanighnavargah**

Epithets of persons, Qualities of things, etc

- **Sankīrnavargah**

Miscellaneous

- **Nānāarthavargah**

Homonymous and polysemous words

- **Avyayavargaḥ**

Indeclinables

- **Lingādisangrahaḥ**

Genders, Masculine, Feminine, Neuter, Masculine and Feminine, Masculine and Neuter, Feminine and Neuter, Three genders, variations of gender

Commentaries:

Amarasimha 's lexicon is the oldest work of the kind now extant. It is of great interest to note that, it has been universally accepted as an authority by the *Brahmans* and the *Jainas* alike. The fact that it has been commented upon by Buddhists like *Subhūticandra*, by Jainas like *Āśādharaṇḍita* and *Nācīrāja*, and by Brahmins like *Ksīrasvāmin*, *Mallīnātha* and *Appayyadīksita* testified to its usefulness to every class of Sanskrit students. The commentaries on *Amarakośa* are available in almost all Indian languages. Translations of the *Amarakośa* into Chinese, Tibetan, Italian, French, Mongolia, Burmese etc. have been recently discovered. It is difficult to provide the exact number of commentaries on *Amarakośa*, as many of them are not available. In the world of Sanskrit literature a separate section is dedicated to the study of *Amarakośa* such as commentaries in Sanskrit and other languages, translations in other languages, other kośas on the basis of *Amarakośa*, etc. M M Patkar in his book "History of Sanskrit Lexicography" mentions nearly 60 commentaries⁹ on *Amarakośa* and also he tells that "Dr. Aufrecht records not less than forty commentaries on it in his "Catalogus Catalogorum"

Amarakośa Translations in Foreign Languages

Chinese translation of *Amarakośa* is written by *Gunarata* in 6th Century A D. The Italian translation of *Amarakośa* is published in 1798. French translation by *ALA Loiseleur-Deslongchamps* is published at Paris in 1839-1845. Tibetan

translation of *Amarakośa* was done by *Kṛticandra* and *Grags-pargyal-mthsan* of *Yar-luns* at *Yam-bu*, the ancient capital of Nepal¹¹ and it is published in 1912¹² Burmese *Amarakośa* was written (calligraphed) in 1938 by *Gunāṅkārā* at the *Shwegu Hall*. Its photo-mechanical reprint is done by *Lokesh Chandra*, son of the most famous lexicographer *Raghu Vīra*. He mentioned in the introduction of his book that his father has collected *Amarakośa* in different languages of Asia. From them he reproduced the Tibetan rendering of *Si-Tu* the well-known grammarian of the seventeenth century¹³.

Sanskrit Commentaries on Amarakośa:

Several well-versed Sanskrit commentaries emerged on *Amarakośa*. Some of these commentaries are commented from some special point of view. E.g. *Vyākhyāsudhā* is commented on grammatical point of view. *Tikāsarvasvam* gives more elaborated grammatical details than *Vyākhyāsudhā*. Details of some famous commentaries on *Amarakośa* are given below.

Rāmāśramī or Vyākhyāsudhā:

Vyākhyāsudhā or *rāmāśramī* is a commentary of *Amarakośa* written by *bhānujī dīksita*, son of the celebrated grammarian *Bhattojī Dīksita*. It is also known as *bhānujībhattīyam* in the name of the author. It is a well known and most celebrated commentary of *amarakośa*. The *mangalāśloka* of *sudhāvyākhyā* itself says that *bhattojī dīksita* is his teacher and he is going to write this commentary on the basis of the opinions of *pāṇini*, *kātyāyana* and *patañjali* the *munitraya* of Sanskrit grammar. The *śloka* is -

वल्लब्धीवल्लभं नत्वा गुरु (गिर) भक्तोजिदीक्षितम्।

आ (अ) मरे विदधे व्याख्या मुनित्रयमतानुगाम्॥

The colophon of *Sudhā* says that *Bhānujī Dīksita* had written this book with the desire of *Kīrtisimhadeva*, ruler of *mahādhaia* and the prince of *Vaghela* family

इति श्रीवघेलवंशोद्भवश्रीमहीधरिवषयाधिपश्रीकीर्तिसहदेवाज्ञया

श्रीभट्टोजिदीक्षितात्मजश्रीभानुजीदीक्षितिवरिचतायाममरटीकाया

व्याख्यासुधारव्यायांतृतीय. काण्ड. समाप्तिमगात्।

It is also clear that *bhānujī dīksita* was the son of *bhattojī dīksita* the well-known grammarian *Sudhā* itself shows his grammatical scholarship as he includes the root of the words, its *gana*, *padī* like *ātmanepadī* or *parasmaipadī* etc And it's *it vyavasthā* like *set*, *anut* or *vet* and the suffix, it's Pāninīya sūtra, sutra number according to *astādhyāyī*, the *vigrahavākya* of the word, etc He also makes lexicological references like *medinīkośa*, *trikāndaśesa*, *viśvakośa* etc Some times *bhānujī dīksita* includes the local name of the word also eg '*jūhī*' *iti khyātāyāh*, '*dopahariyā*' *iti khyātasya* etc We can feel that *bhānujī dīksita*'s deep grammatical knowledge and the familiarity with other kośa's which were available at that time through the study of *sudhāvyākhyā* For our work, we relied on this work a lot and in case of conflict we resorted to this commentary

Amarakośodghātana:

It is a commentary on *Amarakośa* written by *ksīrasvāmīn Nāmaparāyana* or *amarakośodghattana* are the other names of this commentary It is a very old commentary which is available now

Tikāsarvasvam:

It is also a well-known commentary on *Amarakośa*, written by *vandyaghatīya ssarvānanda*, a Bengali scholar Following is the beginning śloka of this commentary

अथ टीकासर्वस्वमृदशटीकावित्करोत्यमरकोशे।

श्रीमत्सर्वानन्दो वन्द्यटीयातिहरपुत्रः ॥

It states that, at the time of *sarvānanda*, ten commentaries existed and studied by the commentators. As the commentator was not satisfied with any of these ten, he was forced to write a new commentary. The ending verses of the commentary

त्रिणि व्याकरणान्यधीत्य सकल साहित्यमालोक्य च
प्राज्ञाध्यापकभाषितानि हृदये न्यस्याकृतेदम्स हि।
प्राज्ञेनानुसनातनेन बहुश पत्यक्षरम्शोधित
जिज्ञासा यदि शब्दवत्सर्नि तदा चैतत्समालोक्यताम्।।

With these verses he states the effort he had taken to write this commentary. The three grammarians referred by him are *Pāṇini*, *Kātyāyana* and *Patañjali*. He refers poets like *Kālidāsa*, *Bhāsa*, *Bāṇa*, *Māgha*, *Bhavabhūti*, *Muṇi*, *Viśākhadatta*, *Vyāsa*, *Vālmīki* etc. We can feel his knowledge in grammar and literature and critical thoughts of the writer through the study of this commentary.

Amarapadapārijāta:

Amarapadapārijāta the commentary of *Amarakośa* written by *Mallinātha*, is the commentator of *pañcamahākāvya*'s. He belongs to the Andhra country, as testified by the usages of Telugu equivalents in his commentary. His Father was *nṛsimhasūrin*, and he is from the family of *bolātunni*.

बोलटिन्मिन्सिंहसूरतनयः श्रीमल्लीनाथो

Mallinātha gives Telugu equivalent to almost all words in his commentary. He uses lots of citations also. Some authors mentioned that some of the citations are not traceable in the Catalogues Catalogorum also. He referred nearly 200 books in his work. The highest citation in the first two *kāṇḍas* are from *Vajayantikośa* of *Yādevaprakāśa*. He gives nearly 213 citations from this book. *Mallinātha*'s knowledge of grammar is very deep, and also it enables him to point out some

points which were missed by many other commentators. The commentary *Amarapadapārijāta* of *Mallinātha* is very rich in case of word knowledge.

Amarapadavivrti:

Amarapadavivrti is the commentary written by *Lingayyasūrin*. He is also known as *Linga* or *Lingabhatta* and his work is known as *Lingabhattīyam*. Like *Mallinātha* he also belonged to Andhra Pradesh. According to the slophons of *Amarapadavivrti* his father's name is *Kāmaya Bhatta*. *Lingayyasūrin* speaks respectfully about *Kṣīrasvāmin* in the introductory verses of his commentary. He carefully memorized *Amarakośodghādanam* before writing his commentary. The verse is -

पदवाक्यप्रमाणज्ञैः क्षीरस्वाम्यादिसूरिभिः।

कृतान् ग्रन्थान्समालोच्य बालानासुखबुद्धेः॥

Lingayyasūrin explains the derivations and meanings of amara-words. He also gives the Telugu equivalent words in his commentary. His commentary was well received all along, especially in the southern region of India.

Amarapadaviveka:

Amarapadaviveka is written by *Maheśvara*. It is also well-known in the name of the commentator *Maheśvara* as *Maheśvaratīkā*. He was the native of Maharashtra as is obvious from his use of Marathi words to explain the Amara words. He didn't mention any information about him anywhere in his book. *Amarapadaviveka* is a good and famous commentary on *Amarakośa*.

Padacandrikā:

Padacandrikā is authored by *Rāyaṃukuta* whose surname is *Brhaspati*. He belongs to Bangala. He mentioned around 16 earlier commentators in his work that were available at his time and he repeatedly referred to some of these commentaries. According to H T Colebrooke¹⁵ those commentators are - *Kṣīrasvāmin*, *Subhīti*, *Hātta Candra*, *Kalinga*, *Konkata*, *Sarvadhara*, *Govardhana*, *Drāvida*, *Bhojarāja*,

Rājadeva (*Tīkāsarvasva*, *Vyākhyāmṛta*, *Mādhavī*, *Madhumādhavī*, *Abhinanda*, *Sarvānanda* - These are commentaries) *Padacandrikā* is one of the full commentary on *Amarakośa*. These are some other well-known commentaries on *Amarakośa*: *Budhamanoramā* by *Vedāntimahādeva*, *Amarapīyūsa* by *Rāmakṛśṇadīkṣita*, *Amaracandrikā* by *Paramānandamaidhila*, *Amarapadamukura* by *Rangācārya*, *Amarakośakaumudī* by *Nārāyaṇa Śaīman*, *Amarapañcikā* by *Nārāyaṇa*, *Kāmadhenū* by *Subhūticandra*, *Kṛiyākalpa* by *Āśādhara*, *Gurubālaprabodhikā* by *Vemkateśvarayaṇvan*, *Trikāṇḍacintāmaṇi* by *Raghunādhacakravartin*, *Trikāṇḍaviveka* by *Rāmanādhavidyāvācaspati*, *Padamañjarī* by *Rāmeśvara Śarman*, *Padārthakaumudī* by *Nārāyaṇa Cakravartin*, *Bhāvinī* by *Bhavanadāsa*, *Mugdabodhinī* by *Bhattasena*, *Lingabhattīya* by *Lingabhatta*, *Subodhinī* by *Jātānu Dīkṣita*.

Other Indian Language Commentaries.

Almost in all Indian languages, the commentaries on *Amarakośa* are available. These are of different types, some are the translations of some famous Sanskrit commentaries, some are Indian language commentaries based on other Sanskrit commentaries.

Malayalam commentaries:

Pārameśvarīyam

Parameśvaran mūssat, the writer of the Malayalam commentary of *Amarakośa* named *Pārameśvarīyam*, has written three more Malayalam commentaries for *Amarakośa*. He is a good critique of *Amarakośa*. He followed *Bhānujīdīkṣita* in his commentaries, but some times he also criticized *Bhānujīdīkṣita*. *Pārameśvarīyam* is the most popular and famous commentary of *Amarakośa* in Malayalam. It has rich grammatical properties. For each word he provides these properties, its endings, gender, case, number, explanation in

Malayalam, another readings (*pāthāntara*) and also quotes other lexicons and books as reference

Trivenī:

Parameśvaran mūssat's another commentary for *Amarakośa* known as *Trivenī* is also a famous Malayalam commentary Like *Pārameśvarīyam* this is not a deep commentary In this he explains only the word's meaning in Malayalam and sometimes in English also This commentary is very useful for a person who is in search of some general information on *Amarakośa* *Samkṣiptapārameśvarī* and *Padārthadīpikāvyākhyā* are the other *Amarakośa* commentaries of *Parameśvaran mūssat*

Sanskrit Lexicons (kośas):

In the book “Indian Lexicography”, Claus Vogel explains the characteristics of Indian lexica as - "Indian dictionaries may be synonymic or homonymic The synonymic dictionaries are systematic catalogues of words with one and the same meaning (*ekārtha*, *samānārtha*), A neat and proper discrimination of both categories is not always practicable since many synonymic lexica include a homonymic section or chapter as well ” Some of the synonymous kośas are *nāmamālā*, *śabdātīkā*, *śabdacandrikā* etc , homonymous are *anekārthasamuccayah*, *anekārthadvanīmañcarī*, *viśvaprakāśa* etc , *dhanvantarīnighantu*, *śabdacandrikā*, *Rājānighantu* come from the domain of medicine *Pārasīprakāśa* of *vedāngarāya* covers the domain of Indian astronomy and astrology The *rājavyavahārakośa* of *Raghunātha* presents technical terms used in administration

Lexicons which have combination of both synonymous and polysemous words

are *amarakośa*, *vaijayanīkośa*, *abhidānacintāmanī* etc Some focus on etymology or some on grammar while some are arranged on the basis of syllables, and so on

The History of Lexicography:

Lexicography, the art and craft of dictionary making, has an important place in the history of language study. We find that dictionaries and glossaries of various types (monolingual and bilingual, general and technical etc.) were compiled and used extensively from the early age of civilization in China, India, Middle East, Greece, and Rome. The earliest known prototypes of dictionary were the West Asian bilingual word lists, dating from the Second Millennium BC. The word lists contained the Sumerian and Akkadian words inscribed in parallel columns on clay tablets in cuneiform writing.

The contents were organized thematically, as thesauruses, for easy and quick reference. After the invention of alphabet later in the same millennium, many centuries passed before an alphabetic ordering system became a common tool for organizing information. The lists came into existence because the Akkadians (Babylonians) had inherited through conquest the culture and traditions of the Sumerians and used the sets of signs as a means by which their scribes could learn what was, in effect, the classical language of writing. Over two thousand years later, in medieval Europe, the same principle was used when scribes who spoke vernacular languages learned to read and write in Latin.

The Chinese tradition of dictionary making is very old. The first known lexicographic work in China is *Shizhou*, which dates back to the 9th century BC. Unfortunately, this work did not survive. After a gap of centuries, during the Han Dynasty (206 BC – 220 AD), the art of lexicography was revived as a part of resurgence in literature. At that time, dictionaries such as *Shuōwén Jiězì* and *Erya* were valuable reference works for understanding the ancient classics. In the later period, particularly during the Tang (618 AD-907 AD) and the Song (960 AD-1279 AD) dynasties, a few more dictionaries like *Yupian*, *Qieyun*, and *Guangyun* were compiled (Shiqi 1982).

An altogether different style of dictionary preparation flourished in ancient India. It started with the collection of obscure words as exemplified in the *nighantus*, continued with formation of one of the bases of *nirukta* and the *padapātha* during the first millennium BC, and ended with a large group of *kosas* composed during the past

fifteen to seventeen hundred years after the Christian era began. Thus, a continuous activity of dictionary making in ancient India provided models for later lexicographical works in the Indo-Aryan and Dravidian languages in India (Katre 1980). Both *nighantu* and *nirukta* are monumental examples of early Indian efforts in dictionary making. Since then a large number of dictionaries and glossaries are prepared in Sanskrit as well as in *pāli*, *prākṛt* and *apabhraṃśa*. Some of them are general purpose dictionaries like *amarakośa*, while some others are partial ones like *deśī nāmamālā*, and still others like *dhātupātha* and *ganapātha* fall under the category of technical glossaries. These dictionaries and glossaries follow different criteria and bases - semantic as well as alphabetic - in their structure and text representation. In *nighantu* all the designations used for a particular word in Vedic literature were included in the list. The ordering was known as *pariyāya*, which was an essential part in the practice of dictionary making in ancient India. There were another two phases known as *nānārtha* that contained various meanings of words, and *linga* that contained the gender information of words. Each *pariyāya* had dictionary of various types. For instance, the *kalpadruma* and the *abhidhāna cintāmaṇi* belonged to *pariyāya* group, *nānārthaśabdakṛatna*, *nānārthamañjarī*, *anekārtha cintāmaṇi*, and *nānārthaśabda* belonged to *nānārtha* group, while *lingādisamgraha* fell in *linga* group. Although there were well-defined schemes of classification of words according to their gender, meaning, and usage as well as the classified dictionaries, which would include words according to the predefined criteria, there were some dictionaries which include all three types of information of words within a single volume. The best examples of this kind are *amarakośa* that

included all three phases of words within three parts conglomerated within a single volume. Due to this fact, this dictionary is known as *trikāṇḍa* (three parts). According to the historical evidences, it was compiled between 400 AD and 600 AD. The most notable aspect of Sanskrit dictionaries is that these were composed in poetic form and words were not arranged in alphabetical order. Among some of the working principles that had been adopted in the construction of lexicons in verse forms may be mentioned the grouping of words according to the number of syllables, and in a few cases, on the basis of the final syllable. Words are most often divided into various classes or groups based on certain features that forced the words to be included in particular groups. This norm of compiling dictionaries in Sanskrit as well as in other vernaculars was practiced not only in ancient India but also in medieval India for a long period of time. The Sanskrit model also provided the basis of similar works in some of the modern Indian languages, particularly for some Dravidian languages (Katre 1980).

Although there was a rich Indian tradition of lexicographical works, it was hardly ever adopted for modern Indian languages. The opening of the 'Western windows' (i.e. the advent of European scholars - missionaries as well as non-missionaries) helped the Indian scholars to adapt an altogether new method for dictionary compilation in modern India. In fact, the production of several bilingual and trilingual dictionaries in various Indian languages with direct involvement of the Western missionaries had a lasting impact on Indian scholars who applied the westernized lexicographical tradition to the Indian languages. The format of presentation, ordering of lexical entries, and the composition of dictionaries were more or less modelled after the dictionaries produced in the West.

The lexicographic tradition in Iran dates back to the pre-Islamic period. The oldest dictionaries are the Qim and Pahlavic dictionaries, both of which were compiled during the Sassanian Dynasty between the first and seventh centuries. The first dictionaries of modern Persian (or Farsi) were compiled in the 9th century due

to the growth and spread of Persian literature (Nafisi 1999 180) The history of Persian lexicography is divided into three periods In the first, prior to the 14th century, Iran and Central Asia were the main centres of dictionary making, and Persian dictionaries were compiled in Farsi speaking regions With the spread of Persian to neighbouring countries and its acceptance as the language of the Royal court and literature in the subcontinent and Turkey, India became the major centre of lexicographic activity This second period lasted from the 14th century to the 19th century Since the second half of the 19th century, there has been continuous growth of lexicographic work and research in Iran Different kinds of dictionaries have been compiled and published, their main characteristic being a strong encyclopaedic orientation These efforts have resulted in the formation of hundreds of monolingual and bilingual dictionaries (Taherian 1998 212-216)

In Europe, “the earliest ‘list of words’ that might be said to constitute the beginnings of English lexicography were the glossaries of Anglo-Saxon priests and schoolmen, compiled to enable those whose competence in Latin was lacking to read Latin manuscripts” (Jackson 1988 111) These glossaries were essentially lists of Latin words with English glosses The *Promptorium Parvulorum* (‘Storehouse [of words] for children’), published around 1440, was an English-Latin dictionary that contained around twelve thousand entries in alphabetical order with verbs and nouns listed separately One of the first printed English-Latin lexicons is known as John Withals’ *Shorte Dictionarie for Young Begynners* (1553) which had a thematic arrangement of words The term ‘dictionary’ in the title of this book was a sixteenth-century borrowing from the Latin *dictionarium* (‘the collection of words’) It is in these English-Latin dictionaries of the Renaissance period that we should perhaps recognize the beginnings of the lexicography of English (Jackson 1988 112) Sir Thomas Elyot compiled the first Latin-English Dictionary entitled *Bibliotheca Eliotae* in 1538 It was followed by a French-English dictionary, *Thesaurus Linguae Romanae et Britannicae* which was published in 1556 by Thomas Cooper Other

dictionaries followed, such as Richard Mulcaster's *Elementarie* (1582), John Florio's *A Worlde of Wordes* (1598), Randle Cotgrave's *A Dictionarie of the French and English Tongues* (1611), and John Kinshieu's *Ductor in Lingus The Guide into the Tongues* (1617)

The first monolingual English dictionary is attributed to Robert Cawdrey, the author of *A Table Alphabeticall* (1604). It contained nearly 3,000 lexical items with short definitions. Other monolingual dictionaries followed, including John Bulloker's *An English Expositor* (1616), Henry Cockerman's *The English Dictionary* (1623), Thomas Blount's *Glossographia* (1656), Edward Phillips's *The New World of English Words* (1658), John Kersey's *A New English Dictionary* (1702), and Nathan Bailey's *Dictionarium Britannicum* (1730). The credit for the first most comprehensive, reliable and exemplary dictionary in English always goes to Samuel Johnson's *The Dictionary of The English Language* (1755). It was followed by a series of dictionaries published in English during the 18th and the 19th century. Some of the most notable examples were James Buchanan's *Linguae Britannicae* (1757), William Johnston's *Pronouncing and Spelling Dictionary* (1764), John Entick's *Spelling Dictionary* (1764), and Thomas Sheridan's *A General Dictionary of the English Language* (1780). This history of English lexicography took a completely new turn with the publication of the *Oxford English Dictionary* (1882) under the competent editorship of John Murray. Detailed information on the history and the diversity of English lexicography are available in McDavid and Duckert (1973), Hartmann (1983), Ilson (1986), Hausmann et al (1989-91), Béjoint (1994), Béjoint (2000), Jackson (2002), Hartmann (2003), and others.

Botanical aspects in amarakośa:

Botany as has been proven had its own dimension in the Indian classical literatures, starting from *vedic* texts. But it had never been delineated in a lexicon.

like *amarakośa* Lots of words relating to plants and tree species were listed in patches and even some of them were explained through their uses But as a source book for botany we find the content very fascinating But one has to never forget that many other sources existed prior to this work and is clearly shown in other chapters

The paragraph below succeeded by the table of *amarakośa* is a comprehensive idea about how we see major information as a data base to the botany of the Indian origin The classification done below is only a tip of an iceberg and with my limited knowledge I could see only a classification at this level It might be superficial or all inclusive, but for sure this is a subject for a serious study in the upcoming days

- 1 **Forest-Garden types:** The classification of forests into small forests and large forests is given right in the beginning-

Atavyaranyam, vipinam, gahanam, kānanam, vanam, mahāranyamaranyānī, grhārāmāstu, nīskutāh, ārāmah, syādupavanam, krtrimam, vanameva, amātyaganikāgehopavane, vrksavātikā, pumānākrīda, udyānam, rājñah, sādharanam, vanam, pramadavanamantahpurocitam, vīthyālirāvalih, panktih, śrenī, lekhāstu, rājayah

- 2 **Tree types:** Many important trees especially used for the medicinal purposes are elisted-

Palāśam, aśvattha, udumbara, jantuphalo, yajñāngo, hemadugdhakah, Etc

- 3 **List of plants:** *indīvara, kuvalaya, padma, nalina, Etc*

- 4 **List of trees:** *pīlau gudaphalah sramsī, nīpapriyakakadambāstu haripriyah, Etc*

- 5 **List of shrubs.** *śephālīkā tu suvahā nīrgundī nīlīkā, godhāpadī tu suvahā, Etc*

- 6 **List of herbs:** *ātmagupta, jaha, vyanda, kapikachu, Etc*

- 7 **List of creepers:** *somavallī, angāravallī, karippalī, kapivallī,*

kolavallī, Etc

8 **List of climbers:** *nakulī surasa nāga sugandha gandhanakulī
nakulesta bhujangāksī*, Etc

9 **List of grasses:** *kuś-kuś, kuśa*, Etc

Mention of parasites and epiphytes: According to Seal, *vrksādami vrksaruha* represent parasites and epiphytes respectively

| <u>Sanskrtam</u> | <u>English/Latin equivalents</u> |
|---|--|
| atavyaranyam, vipinam, gahanam, kānanam, vanam, | Forest |
| mahāranyamaranyānī, | Large forest |
| grhāīāmāstu, niskutāh, | A garden in a house |
| āīāmah syādupavanam kṛtrīmam vanameva yat | Grove |
| amātyaganīkāgehopavane vrksavātīkā | Pleasure grove |
| pumānākiīda udyānam īājñāh sādhanānam vanam | Royal public garden |
| syādetadeva pīamadavanamantahpurocitam | Royal garden attached to the harem |
| vīthyālīrāvalīh panktīh śrenī | Row line |
| lekhāstu rājayah | Continuous line/ multitudes of grooves |
| vanyā vanasamūhe syādankuro'bhīnavodbhīdī | Shoot or sprout |
| vrkso mahīruhah śākhī vītapī pādapastaruḥ anokahah kutah śālāh palāśī drudrumāgamāh | Tree |
| vānaspatyah phalāih puspāt | Fruit bearing tree that |

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| | blossoms, Ex Mango |
| tairapuspādvānaspatih | A fruit bearing tree that doesn't blossom, Ex Jackfruit |
| osadhyah phalapākāntāh | A plant that dies after it's fruit ripe, Ex Plantain or paddy (Yearly crop) |
| syuravandhyahphalegrāh | Plants that bear fruit |
| vandhyo'phalo'vakeśī ca | A barren tree |
| phalavānphalīnah phalī | A plant in bearing |
| praphullotphullasamphullavyākōśavikacasphutāh phullaścāte vikāsite | Blown, as a flower |
| syuravandhyādayastisu, sthānurvā nā dhruvah śanku | The trunk of a tree of which the branches have been looped off |
| ahrasvaśākḥāśīphah ksupah | Any small tree |
| aparakānde stambagulmau | Shrub |
| vallī tu vīatātīratā | Creeper |
| latā pīatānīnī vīudgulmīnyulapa ityapī | A cluster of creepers |
| nagādyāī oha ucchrāya utsedhaścocchīayaśca sah | Height |
| astrī pīakāndah skandhah syānmūlācchākḥādhīstaroh | Stem of a tree |
| same śākḥālate | Branch |
| Skandhaśākḥāśāle | The fork or principal branch of |

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| | a tree |
| śīphājate | A cluster of roots |
| śākhāśīphāvai ohah | A fibrous root |
| syānmūlāccāgram gatā latā | A pendent branch that takes the fresh root, as that of a banyan |
| śīrogram śikharam vā nā | Top of a tree |
| mūlam budhno'nghrināmakah | Root |
| sāro majjā | Hardness |
| narī tvakstī valkam valkalamastīyām | Bark, rind |
| kāstham dārvī | Wood |
| indhanam tvedha idhmamedhah samitstriyām | Fuel |
| niskuhah kotaram vā nā | The hollow of the tree |
| vallarīmañjarīh striyau | A compound pedicel |
| patram palāśam chadanam dalam parnam chadah pumān | Leaf |
| pallavo'stī kīsalayam | Sprout |
| vistāro vitapo'stīyām | The branch of a tree with its new shoots |
| vrksādīnām phalam sasyam | Fruit, grain |
| vrntam prasavabandhanam | Foot- stalk, pedicel or |

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| | peduncle of a leaf or fruit |
| āme phale śalātuh sya | Unripe fruit |
| chuske vānamubhe tīsu | Withheld fruit |
| ksārako jālakam klībe | Ovary |
| kalikā korakah pumān | Enlarged ovary or fruit just formed |
| syādgucchakastu stabakah | Cluster of blossoms |
| kunmalo mukulo'striyaṁ | An opening bud |
| striyah sumanasah puspam prasūnam kusumam sumam | Flower, blossom |
| makarandah pusparasah | The nectar of the flower |
| parāgah sumanorajah | The pollen or farina of a flower |
| dvihīnam prasave sarvam harītakyaḍayah striyaṁ, āśvatthavainavaplāksanaiyagrodhaingudam phale, bāhatam ca | Fruit of the sacred fig tree (Ficus Religiosa), Bamboo (Bambusa), Waved-leaf Fig tree (Ficus infectoria), Banian (Ficus indica), Indian almond tree (Terminalla catappa), Night shade (Solanum Jacquini) |
| phale jambvā jambūh stiī jambu jāmbavam | Fruit of the blue apple tree (Eugenia jambolana) |

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| puspe jātiprabhrtayah svalingāh viīhayah phale, vidāryādyāstu mūle'pī puspe klībe'pī pātalā, bodhidūmaścaladalah pippalah kuñjaraśānah, aśvattha | The Sacred fig tree (Ficus religiosa) |
| tha kapitthe syuidadhittagrāhimanmathāh, tasmindadhīphalah puspaphaladantaśāthāvapi | The wood apple tree (Feronia elephantum) |
| udumbaro jantuphalo yajñāngo hemadugdhakah | The glomerous fig tree (Ficus glomerata) |
| kovidāre camarakah kuddālo yugapatrakah | The mountain ebony tree (Beuhnia variegata) |
| saptaparno viśālatvaksāīado viśamacchadah | The tree alstonia scholaris |
| āīagvadhe īājavrksaśampākacatuṅgulāh, ārevatavyādhihātakrtamālasuvānakāh | The tree cassia fistula |
| syurjambūe dantaśāthajambhajambhīrajambhalāh | Lime or the lemon (Citrus medica var Limonum) |
| varuno varanah setustiktaśākah kumāīakah | The tree capparis trifoliata |
| pumnāge purusastungah kesaro devavallabhah | A kind of euphorbia (Rottlera tanctoria) |
| pāribhadre nimbataruṁmandāīah pāījātakah | The coral tree (Jatropha multifida) |
| tiniśe syandano nemī rathadrūatimuktakah, vañjulaścītakrecātha | A kind of mimosa |
| dvau pītanakapītanau, āmīātake | The hog plum (Spondias magnifera) |
| madhūke tu gudapuspamadhudrumau, vānaprasthamadhusthīlau | The tree bassia latifolia |

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| jalaje'tra madhūlakah | The tree bassia malabarica |
| pīlau gudaphalah sramsī | The tree careya arboria |
| tasmimstu gīrisambhave, aksotakandaiālau dva | The mountain species of the same |
| āvankote tu nikocakah | The tree alangium lamarckii |
| palāśe kimsūkah parno vātapoto | The bastard teak (Butea frondosa) |
| atha vetase, rathābhī apuspavidui aśītavānīravañjulāh | The ratten (calamus spp) |
| dvaui paivyādhavidulau nādeyī cāmbu vetase | A kind of the same growing in water |
| śobhāñjane śigrutīksnagandhakāksīvamocakāh | The India horse-raddish tree (Moringa plerygosperma) |
| rakto'sau madhuśīgruh syāt | A red kind of the same |
| aristah phenīlah samau | The soap nut tree (Sapindus mukorossi) |
| bīlve śāndilyaśailūsau mālūraśīphalāvapi | The Bengal guince (Aegle marmelos) |
| plakso jatī paikatī syāt | The waved-fig tree (Ficus infectoria) |
| nyagīodho bahupādvatah | The banyan (Ficus indica) |
| gālavah śābaro lodhī astu itastīlvamāī janau | A benzoin tree (Symplocos |

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| | Racemosa) |
| āmīaścūto rasālo'sau | The mango tree (Magnifera indica) |
| sahakāro'tisaurabhah | A tree bearing fragrant sort of mango |
| kumbholūkhalakam klībe kauśiko gugguluh purah | A tree yielding a fragrant gum (Rasin bdellium) |
| śeluh ślesmātakah śīta uddālo bahuvāarakah | The tree Cordia myxa |
| īājādanam priyālah syātsannakadrurdhanuhpatah | The tree Buchanania latifolia |
| gambhārī sarvatobhadīā kāśmarī madhupaṇīkā, śīṭparṇī bhadīapaṇī ca kāśmaīyaśa | The tree Amelina arboria |
| pyatha dvayoh, kaikandhūrbadaī kolih kolam | The jujube tree (Zizyphus jujuba) |
| kuvalaphenīle, sauṇīram badaram ghonta | The fruit of the jujube tree |
| apyatha syātsvādukantakah, vikankatah suvāvrkso granthilo vyāghīapādapi | A kind of plum tree (Flacourtia sapida) |
| airāvato nāgarango | A tree producing a kind of bitter orange |
| nādeyī bhūmijambukā | A round bad kind of the same |
| tindukah sphūṇjakah kālaskandhaśca śītisāīake | A kind of ebony |
| kākenduh kulakah kākatindukah | Another kind of ebony |
| Kākapīluke, golīdho jhātalo ghantāpātālīrmoksamuskakau | A tree Bryonia callosa |

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| tīlakah ksurakah śīmān | A kind of Cyrtandree |
| samau pīculajhāvukau | The tree Tamarix indica |
| śrīparnikā kumudikā kumbhī kaitaryakatphalau | The teak tree Tectona grandis |
| kramukah pattikākhyah syātpattī lāksāprasādanah | A tree on which lac is produced |
| tūdastu yūpah kramuko brahmanyō bīahmadāru ca, tūlam ca | The Arecanut tree (Areca catachu) |
| nīpapriyakakadambāstu haipriyah | The tree Anhocephalus cadamba The marking nut plant (Semecarpus anacardium) |
| gardabhānde kandaīālaka pītanāsupārśvakāh plaksa | The tree Ficus infectoria |
| tintidī ciñcāmlīkā | The tamarind tree (Tamarindus indica) |
| tho pītasārake sarjakāsanabandhūkapuspapriyakajīvakāh | The tree Pterocarpus marsupium |
| sāle tu sajakāīśyāśvakānakāh sasyasambarah | The sal tree (Shorea robusta) |
| nadīsaṃjo vīataṃ uṇḍī adruḥ kakubho'rjunah | The red sal |
| rājādanah phalādhyaksah ksīrikāyāmatha dvayoh | The tree Wrightia tinctoria |
| ingudī tāpasataru | The tree Terminalia catappa |
| bhūrje ca mīmī dutvacau | A king birch |

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| picchilā pūīanī mocā sthūāyuh śālmālīrdvayoh | The silk-cotton, the silk cotton tree (Bombax malabaricum) |
| picchā tu śālmālīveste | Its rasn |
| picchā tu śālmālīveste rocanah kūtaśālmālīh | A red kind of silk cotton tree |
| cirabilvo naktamālah karajaśca karañjake | Tree Pongamia glabra |
| prakīryah pūtikarajah pūtikah kalīmāarakah | The plant Coesalpinia bonducella |
| karañjabhedāh sdgrantho markatyangāīavallaiī | Varieties of Pongamia Glabra |
| īohī rohītakah plīhaśatīudādīmapuspakah | Erythrina indica |
| gāyatrī bālatanayah khadīro dantadhāvanah | The catachu tree (Acacia catachu) |
| arīmedo vitkhadīre | False catechu |
| kadarah khadīre site somavalko | White catechu |
| 'pyatha vyāghrapucchagandharvahastakau eranda uīubūkaśca rucakaścitrikaśca sah cañcuh pañcāngulo mandavardhamānavyadambakāh | The castor-oil plant (Ricinus communis) |
| alpā śamī śamīrah syāt | The tree Acacia suma |
| śamī saktuphalā śivā | The large kind of the same |
| pindītako marubakah śvasanah karahātakah śalyaśca madane | The thorny shrub (Vingueria spinoza) |
| śakīpādapah pārībhadrasah, bhadradāru drukīlīmam pītadāru ca dāru ca pūtikāstham ca sapta syurdevadārunya | Deodar (Cedrus deodara) |

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| tha dvayoh pātalih pātalāmoghā kācasthālī phaleruhā krsnavrntā kubeiāksī | The trumpet flower tree |
| śyāmā tu mahilāhvayā | The another variety of the same |
| latā govandanī gundrā priyanguh phalinī phalī vīsvaksenā gandhapālī kāmabhā pīyakaśca sā | A medicinal tree |
| mandūkaparnapatrornanatakatvangatuntukāh, syonākaśukanāsarksadī ghavrntakutannatāh | The tree Bignonia indica |
| amrtā ca vayahsthā ca | The tree Phyllanthus emblica |
| trīlingastu bibhītakah nāksastusah karsaphalo bhūtāvāsah kalidrumah | The plant Terminalia berlica |
| karītakī haimavatī cetakī śīeyasī śivā | The plant terminalia citrine |
| pītadruh saralah pūtīkāsthām | A sort of spine (Pinus longifolia) |
| cātha drumotpalah karnīkāh parivyādho | A hill lotus tree (Cochlospermum gossypium) |
| lakuco likuco dahuh | A elephant lime tree |
| panasah kantakīphalo | The jack tree (Artocarpus integrifolia) |
| niculo hijjala | The tree Barringtonia acutangula |
| ambujah kākodumbarikā phalgurmalayū jaghanephalā | Opposite leaved fig tree (Ficus racemosa) |
| arīstah sarvatobhadrahingunī yāsamālakāh picumandaśca nimbe | The neem tree (Melia azadarac) |

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| 'tha piçchilāguruśimśapā | The Sissoo tree (Dalbergiasissoo) |
| kapilā bhasmagarbhā sā | The fragrant kind of the same |
| śūṣastu kapītanah bhandilo'pya | The tree Acacia sirisa |
| atha cāmpeyaścampako hemapuspakah | The caampaka tree (Michelia champaca) |
| etasya kalikā gandhaphalī syāt | A champaka bud |
| atha kesare bakulo | The tree Mimusops elengi |
| vañjulo'śoke | The ashoka tree (Uvaria longifolia) |
| samau karakādāmau | The pomegranate tree (Punica granatum) |
| cāmpeyah kesaro nāgakesarah kāñcanāhvayah | The tree Mesua ferrea |
| ayā jayantī tarkāī nādeyī vajayantikā | A thorny yellow myrobalan tree |
| śrīparnamagnīmanthah syātkanikā ganikārikā jaya | A small kind of emblic myrobalan tree (Phyllanthus emblica) |
| atha kutajah śakro vatsako guṇmallikā | A medicinal plant (Holarrhena antidysentrica) |
| etasyaiva kalingendrayavabhadrayavam phale | Its fruit |

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| krsnapākaphalāvīgnasusenāḥ karamardake | A kind of blackberry tree |
| kālaskandhastamālah syāttāpiccho | The tree Xanthochymus pictorius |
| pyatha sinduke sinduvāiendrasuiasau nīrgundīndīāniketyapi | The tree Vitex negundo |
| venī garā gaiī devatādo jīmūta ityapi | Kushkus or Lemon grass (Andropogon) |
| śrīhastinī tu bhūiundī | The shrub (Avrusprecatorius) |
| trnaśūnyam tu mallikā bhūpadī śītabhūiūśca | The Arabia jasmine (jasminum sambac) |
| saivāsphotā vanodbhavā | The wild jasmine |
| śephālikā tu suvahā nīgundī nīlikā ca sā | The shrub Vitex trifolia |
| sītāsau śvetasurasā bhūtaveśyatha | A white kind of the same |
| ganikā yūthikāmbasthā | A kind of jasmine (Jaminum aurica latum) |
| sā pītā hemapuspikā | The yellow jasmine |
| atimuktah pundrakah syādvāsantī mādhavī latā | The large creeper (Gaertenra racemosa) |
| sumanā mālatī jātiḥ | The large flowered jasmine (Jasminum grandiflorum) |
| saptalā navamālikā | The double jasmine |
| mādhyam kundam | Many flowered jasmine (Jasminum multiflorum) |
| raktakastu bandhūko bandhujīvakah | The plant Pentapetes |

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| | Phoenicea |
| sahā kumārī tarani | A small amaranth |
| ramlānastu mahāsahā | A large amaranth |
| tati a śone kurabaka | The crimson amaranth |
| statra pīte kurakantakah | The yellow amaranth |
| nīlī jhīntī dvayoi bānā dāsī cārtagalaśca sā | The blue amaranth |
| saireyakastu jhīntī syāt | The thorny amaranth |
| tasminkurabako'rune | The crimson thorny amaranth |
| pītā kuīantako jhīntī tasmīnsahacarī dvayoh | The yellow thorny amaranth |
| ondrapuspam japa | Hibiscus rosasinensis |
| puspam vajrapuspam tilasya yat | The gingely plant (Sesamum indicum) |
| pratihāsaśataprasacandātahayamāīakāh karavīre | The oleander plant (Nerium odorum) |
| karīe tu kīakaragranthilāvubhau | A leafless plant (Cpprisaphylla) |
| unmattah kītavo dhūrto | Datura stramonium |
| dhattūrah kanakāhvayah mātulo madana | The thorn apple tree Datura metel |
| `cāsyā phale mātulaputīakah | Its fruit |
| phalapūro bījapūo rucako mātulungake | The citron tree (Citrus medical) |
| samīrano marubakah prasthapuspah phanījjakah jambūo | The Mint plant (Mentha) |
| apyatha parnāse kathīñjarakutherakau | A plant like sweet thym |

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| | (Thymus) |
| sīte'ṛjako | A white kind of the same |
| atra pāthī tu citrako vahnīsamjñakah | The Ceylon leadwort (Plumbago zeylanica) |
| arkāhvavasukāśphotaganaḥ ūpavikū anāḥ mandā aścārkaparna | A plant Asclepias gigantea |
| atra śukle'larkapratāpasau | White kind of Asclepias gigantea |
| tīa śukle'larkapratāpasau śīvamallī pāśupata kāsthīlo buko vasuh | The aeschynomene grandiflora |
| vandā vrksādanī vrksaḥ uḥā jīvantiketyapi | Any parasytic plant |
| vatsādanī chinnaruhā gudūcī tantīkāmrtā jīvantikā somavallī viśalyā madhuparnyapi | The soma or moon plant (Asclepias aphylla) |
| mūrvā devī madhuśasā moratā tejanī śīlavā madhūlikā madhuśrenī gokanī pīluparnyapi | The plant Aletris hyacinthoides |
| pātāmbastā viddhakarnnī sthāpanī śīeyasī śasā ekāstīlā pāpacelī piācīnā vanatiktikā | A kind of ginger |
| katuh katambhaśśokaḥ ohinī katurōhinī matsyapittā krsnabhedī cakraṅgī śakulādanī | The black hellebore |
| ātmaguptājahāvyandā kandūrā piāviśāyanī rsyaproktā śūkaśimbhī kapīkacchuśca markatī | The cowhage or cowitch plant |
| cītropacitā nyagrodhī dīavantī śambarī viśā pratyakśrenī sutaśīenī śandā mūsīkaparnyapi | The plant Salvia cucullata |
| apāmāī gah śaīkhaīko dhāmāī gavamayūī akau pratyakparnī keśaparnī kunīhī khaī amañjarī | The plant Achyrinthes aspera |
| hañjīkā biāmhanī padmā bhaīgī biāhmanayastikā angāravallī bāleyaśākabā baravāī dhakāḥ | The plant Ovieda verticillata |

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| mañjistā yīkasā jingī samangā kālamesikā mandūkaparnī mandīī bhandī yojanavallyapī | The bengal madder (Rubia tinctoria) |
| yāso yavāso duhsparsō dhanvayāsah kunāśakah rodanī kacchurānantā samudrāntā durālabhā | The plant Cassia esculenta |
| prśnīparnī prthakparnī citraparnyanghrivallikā | The plant Hedysarum logopodoides |
| krostuvinnā sīmhapucchī kalaśī dhāvanī guhā | The plant Hemionitis scordifolia |
| nīdīgdhikā spīśī vyāghrī bīhatī kankāīkī pracodanī kulī ksudīā duhsparsā rāstrīketyapī | The egg plant or brinjal (Solanum jacquinii) |
| nīlī kālā klītakīkā gīāmīnā madhupāīnikā rañjanī śīīphalī tutthā dīonī dolā ca nīlīnī | The indigo plant (Indigofera tinctoria) |
| avalgūjah somaiājī suvallīh somavallīkā kālamesī kīsnaphalī bākucī pūtīphalyapī | The shrub Guilandina Bonducella |
| krsnopakulyā vaidehī māgadhī capalā kanā usanā pīppalī śaundī kola | The long pepper plant (Chavica roxburghii) |
| atha karīppalī kapīvallī kolavallī śīeyasī vaśīnah pumān | The elephant pepper plant |
| cavyam tu cavikā | Another kind of pepper |
| kākacīñcīguñje tu krsnalā | A variety of the shrub Abrus (The berry forms the smallest jewelers weight) |
| palamkasā tvīksugandhā śvadamstrā vādukantakah gokantako goksarako vanaśrngāta ityapī | A small kind of Calotropis |
| viśvā viśā pratīvisātīvisopavīśārūnā śrngī mahausadham | Betuline a resinous substance obtained from the birch Betula |
| cātha ksīrāvī dugdhikā same | A small kind of Mimosa |

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| śatamūlī bahusutābhīrūrindīvaiī vaiī īsyapīoktābhīrupatī īnāīāyanyah śatāvaiī aheru | The plant Asparagus racemosa |
| atha pītadrukālīyakahāīdīavah dārvī pacampacā dāī uhaīdīā paījanītyapī | The plant Curcuma zantorrhiza |
| vacogragandhā sadgīanthā golomī śataparvikā | The orris plant (Iris flowrentina) |
| śuklā haīmavaīī | The white kind of the same |
| vaidhyamāī simhyau tu vāsīkā vrso'tarūsah simhāsyo vāsako vājīdantakah | The plant Aristolochia bractea |
| syādvīsnukrāntāpaiājītā | The plant Clitorea ternat |
| īksugandhā tu kāndeksukokīlākseksuraksuīāh | A kind of tares (Liloum) |
| śāleyah syācchītaśīvaśchatrā madhuīkā mīsīh mīsīeya | A kind of fennel (Anethumpanmorium) |
| āpyatha sīhundo vajrah snukstīī snuhī gudā samantadugdha | The milk hedge plant |
| atho vellamamoghā citratandulā tandulaśca krīmīghnaśca vīdangam pumnapumsakam | A medicinal herb (Embelia ribes) |
| balā vātyālako | A small kind of castor oil plant |
| ghantāīavā tu śanapuspīkā | A kind of hemp plant (Crotalariajuncea) |
| mīdvīkā gostanī dīāksā svādvī madhurasetī ca | The grape vine (Vitis vinifera) |
| sarvānubhūtiḥ saīalā tīputā trīvītā tīvīt tribhandī rocanī | I pomoea turpethum |
| śyāmāpālīndhyau tu susenīkā kālā masūravīdalārdhacandīā kālamesīkā | A blue kind of the same |

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| madhukam klītakam yastimadhukam madhuyastikā | Liquorice Glycyrrhiza Glabra |
| vidārī ksīraśukleksugandhā krostī tu yā sitā | A white Gourd (Cucurbita) |
| anyā ksīnavidārī syānmahāśvetaksagandhikā | A kind of ground gourd |
| lāngalī śāī adī toyapippalī śakulādanī | A water plant (Jussieuea repens) |
| khaiāśvā kāī avī dīpyo mayūo locamastakah | A kind of bishop's weed (Sison amomum) |
| gopī śyāmā śāīivā syādanantotpalaśāīivā | A medicinal herb (Periploca indica) |
| yogyamiddhīh siddhīlaksmīyau viddheīapyāhvayā ime | Name of a drug |
| kadalī vāīanabusā īambhā mocāmsūmatphalā kāsthīlā | The plantain tree (Musa sapientum) |
| mudgaparnī tu kākamudgā sahetyapī | A wild kind of green gram |
| vārtākī hīngulī sīmī bhantākī duspradharsinī | The egg plant of brinjal (Solanum melongena) |
| nākulī sunasā īāsnā sugandhā gandhanākulī nakulestā bhujamgāksī chatīākī suvahā ca sā | Ichneumon plant |
| vidāīgandhāmsūmatī sālaparnī sthīā dhruvā | A sensitive plant allide to Rottleria tinctoria |
| tundikeīī samudrāntā kārpāsī badareti ca | The cotton plant (Gossypaum) |
| bhāīadvājī tu sā vanyā | A wild kind of cotton plant |
| śrngī tu rsabho viśah | A kind of drug |
| gāngerukī nāgabalā jhasā hrasvagavedhukā | The gourd Sulcatus |
| dhāmāīgavo ghośakah | A bitter kind of gourd |

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| syānmahājālī sa pītakah | A wild kind of god |
| jyotsnī patolīkā jālī | The snake gourd (Trichosanthes anguina) |
| nādeyī bhūmijambukā | The plant Flacourtia sepiaria |
| syāllāngalīkyagnīśikhā | The plant Gloriosa superb |
| kākāngī kākānāsīkā | A small gourd (Bryonia grandis) |
| godhāpadī tu suvahā | Ascendent shrub (Cissus pedate) |
| musalī tālamūlikā | The plant Ccurculigo orchioides |
| ajaśrngī visānī syāt | The plant Odina wondier |
| agojīhvādārvike same | The plant Hibiscus esculentus |
| tāmbūlavallī tambūlī nāgavallīya | The betel vine (Chavica betel) |
| atha dvijā harenū enukā kauntī kapilā bhasmagandhinī | The plant Colodendron inerme |
| elāvālukamaileyam sugandhī haivālukam vālukam | The plant Bryonia callosa |
| cātha pālankyām mukundah kundakundurū | Gum elibanum |
| bālam hībeīabarhisthodīcyam keśāmbunāma ca | A kind of grass yielding a perfume (Andropogan schoenanthus) |
| kālānusāryavrrddhāśmapuspaśītaśivānī tu śaileyam | A kind of benzoin (Lichen rotundatus) |
| tālaparnī tu daityā gandhakutī muiā gandhinī | A kind of drug |
| gajabhaksyā tu suvahā suīabhī rasā maheīanā | A clearing nut plant |

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| kundurukī sallakī hlādinīti ca | (Strychnos potatorum) |
| agnijvālāsubhikse tu dhātakī dhātupuspikā | The plant Bauheniaspicata |
| prthvikā candravālailā niskutirbahila | A kind of cardamom plant |
| tha sā sūksmopakuñcikā tutthā koiangī tūputā trutih | A smaller kind of the same |
| vyādhih kustam pārībhāvyam vāpyam pākalamutpalam | A medicinal plant (Costus) |
| śankhinī corapuspi syātkeśi | A kind of grass Andropogon aciculatum |
| nyatha vitunnakah jhatāmalājghatā tālī śivā tāmalakīti ca | A small kind of Phyllanthus emblica |
| prapaundaiikam paundaya | Root of the white lotus (Nimphoea) |
| matha tunnah kuberah kunh kacchah kāntalako nandivrkasa | Nerium coronarium |
| tha rāksasī candā dhanahaiī ksemaduspatraganahāsakāh | The plant Pavonia adorada |
| vyādāyudham vyāghrianakham karajam cakrakāiakam | The plant Galadua Arborea |
| susiā vidrumalatā kapotānghrīnatī nalī dhamanyañjanakeśi ca | A kind of drug or perfume |
| hanurhattavilāsini śuktih śankhah khurah koladalam nakha | The another kind of the same |
| mathādhakī kāksī mrtsnā tuvaikā mittālakasuiāstraje | A wild kind of peagon (Cajanus) |
| kutannatam dāśapuram vāneyam paripelavam plavagopuragonaidakarvartimustakāni ca | A sort of grass, Cyperus rotundus |

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| granthiparnam śukam barham puspanam sthauneyakukkure | A medicinal plant (Eartamisia indica) |
| marunmālā tu piśunā sprkkā devī latā laghuh samudrāntā vadhūh kotivarsā lankopiketyapi | A medicinal plant |
| tapasvinī jatāmāmsī jatilā lomaśāmsī | The India spikenard (Valeriana jatamansi) |
| tvakpatramutkatam bhrngam tvacam cocam varāṅgakam | The clow (Mirystica caryothylla) |
| karcūiako drāvidakah kālpako vedhamukhyakah | The Zedoary or Curcuma zedrumvet |
| osadhyo jātimātre syu | Any creeper |
| jātau sarvamausadham | Medicine |
| śākākhyam patrapuspādī | A pot herb, any vegetable |
| tandulīyo'lpamāṁsah | Amaranthus campestis |
| viśalyāgnīśikhānantā phalinī śakrapuspikā | The side cardifolia |
| syāddaksagandhā chagalāntrayāvegī rddhadārahah jungo | The Sphoeranthus indicus |
| bramhī tu matsyāksī vayahsthā somavallai | The pot herb Achyranthes triandra |
| patuparnī haimavatī svainaksūī himāvatī | The wild pulse Phascolus mungo |
| hayapucchī tu kāmbojī māsaparnī mahāsahā tundikeī ī aktaphalā bimbikā pīlupai nyapi | A vegetable Brionia grandis |
| barbaiā kabarī tungī kharapuspājagandhikā | A small shrub (Cleome pentaphylla) |
| elāparnī tu suvahā īśnā yuktarasā ca sā | A kind of sarsaparilla (Smilax |

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| | china) |
| cāngeīī cukrikā dantaśatāmbasthāmlalonikā | The yellow wood sorrel (Oxalis corniculata) |
| sahasravedhī cukro'mlavetasah śatavedhyapī namaskārī gandakārī samangā khadīretyapī | A sensitive plant |
| jīvantī jīvanī jīvā jīvanīyā madhusiavā | A certain pot herb |
| kūrcaśīrso madhurakah sṛngahī asvāngajīvakāh | A kind of drug |
| kuātatīkto bhūnimbo'nāryatikto'tha | Chiretta or a sort of gentian (Gentiana cherayta) |
| saptalā vimalā sātālā bhūriphenā caimakasetyapī | A certain shrub |
| vāyasolī svādurasā vayahsthātha makūlakah | A medicinal shrub (Aleria blongifolia) |
| nikumbho dantikā piatyakśrenyudumbaraparnyapī | The croton oil plant (Croton tiglium) |
| ajamodā tūgragandhā bīahmadai bhā yavānikā | The seed of bishop's weed (Sison ammi) |
| mūle puskarakāsmī apadmapatrāni pauskare | The root of a blue lotus (Costus speciosus) |
| avyathātīcarā padmā cāīatī padmacāīinī | The cashmere hill lotus |
| kāmpilyah kaikaśāścandro iaktāngo iocanītyapī | The name of a plant |
| prapunnādestvedagajo dadiughnaśca | The Cassia tora |
| kamardakah padmāta uranākhyāśca palāndustu sukandakah | The onion (Allium) |
| latāī kadudī umau tatra harite | A cultivated kind of the same |
| tha mahausadham laśunam giñjanāristamahākandaī asonakāh | Garlic |

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| punarnavā tu śothaghnī | Hog-weed |
| vitunnam sunisannakam | A certain creeper |
| syādvāatakah śītalopaiājītā śanaparnyapī | The Coronilla sesban |
| pārāvatānghrih katabhī panyā jyotismatī latā | The heartpea Halicacabum cardiosperamum |
| vārsikam tiāyamānā syāttiāyantī balabhadrikā | A certain creeper (Dalbergia) |
| visvaksenapriyā gīstirvārāhī badaīetyapī | An esculent root (Dioscorea) |
| mārkavo bhūngaiājah syāt | The shrub Ecliptapro strata |
| kākamācī tu vāyasī | A vegetable, (Solamum indicum) |
| śatapuspā sitacchatīātīcchatīā madhuiā mīsih avākpuspī kāīavī ca | A large kind of the fennel (Anethum panorium) |
| saranā tu prasāīnī tasyām katambhaiā īājabalā bhadraīetyapī janī jatūkā rajanī jatukīccakravartinī samsparśāth | A medicinal plant (Rubus) |
| śatī gandhamūlī sadgīanthīketyapī karcūīopī palāśo | The knotty Zedoary |
| tha kāīavellah kathīllakah susavī ca | The creeper Mordīca charantia |
| atha kulakam patolastīktakah patuh | A bitter creeper (Trichosanthes laciniata) |
| kūsmāndakastu karkāī urui | A gourd (Cucurbita agenaria) |
| vāruh karkatī stīīyau | A kind of cucumber |
| īksvākuh katutumbī syāt | The bottle gourd (Cagenaria vulgaris) |
| tumbyalābūīubhe same | The sweet gourd |

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| citiā gavāksī godumbā | The plant callosa |
| viśālā tvindīavārunī | The colosynth plant (Citrullus colocynthus) |
| arśoghnah sūranah kando | Any bulbous esculent root |
| gandīrastu samasthīlā | A medicinal plant (Solanum speciosum) |
| kalambyupodikā stī tu mūlakam hīlamocikā vāstukam śākabhedāh syur | Different kinds of vegetables |
| dūrvā tu śataparvikā sahasīavīyābhārgavyau īuhānanta | The grass Panicum daotilon |
| tha sā sitā golomī śatavīryā | The same with the white blossom |
| ca gandālī śakulāksakā | A creeping kind of the same |
| kuruvindo meghanāmā mustā mustakamastryām | A fragrant grass (Cyperus rotundus) |
| syādbhadramustako gundrā | A kind of the same |
| cūdālā cakīaloccatā | A knotty kind of the same |
| vamśe tvaksārakamāīatvācīsāīatīnadhvajāh śataparvā yavaphalo venumaskāīatejanāh | A hollow kind of a bamboo |
| venavah kīcakāste syūīye svanantyanīloddhatāh | A bamboo which makes a hollow sound when the wind passes through it |
| granthīnā parvapauśī | The joints or knots in a bamboo stem |
| gundrastejanakah śai ah | A kind of reed |
| nadastu dhamanah potakalo | Another kind of reed |

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| atho kāsamastrīyām ıksugandhā potagalāh | The grass Saccharum sara |
| atho kāsamastrīyām ıksugandhā potagalāh pumsı bhūmnı tu balvajāh | A grass Saccharum cylindricum |
| rasāla ıksu | The sugarcane saccharum officinarum |
| stadbhedāh pundiakāntāıakādayah | The different varieties of sugarcane |
| pundrakāntārakādayah syādvīranam vīıatāıam | The grass used for thatching (Andropogon muricatum) |
| mūle'syośīramastrīyām abhayam naladam sevyamamınālam jalāśayam lāmajjakam laghulayamavadāhestakāpathe | Kus-kus (Andropogon) |
| nadādayastınam gai mucchyāmākapi amukhā apı | Grass, or any graminious plant |
| astrī kuśam kutho darbha pavıtram | Sacrificial grass (Poacynosuroides) |
| matha kattınam pauıasaugandhıkadhyāmadevejagdhakarauhsam | Spice grass (Andropogon schoenanthus) |
| Chatıātıcchatıapālaghnau | A mushroom |
| mālātınakabhūstıne | A fragrant grass |
| śaspan bālatrnam | A young grass |
| ghāso yavasam | A fodder grass |
| tınamarjunam | A mixed grass |
| trnānām samhatıstınyā | A bundle of grass |
| nadyā tu nadasamhatıh | A Bundle of reeds |
| trnarājāhvayastālo | Palmyra palm (Borassus |

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| | flabelliformis) |
| nāḷikerastu lāṅgalī | A coconut palm (Cocos nucifera) |
| ghontā tu pūgah kīamuko guvākah khapui o | The areca plant (Areca catechu) |
| asya tu phalamudvega | The arecanut |
| mete ca hīntālasahitāstīayah khaijūrah ketakī tālī khaijuī ca tīnadīumāh | The marshy date tree the date tree Phoenix sylvestris, the tree Pandanus odor atissimus, the tree Corypha taliera, the toddy date tree |

Thus, the table attached is a reflection of thoughts found in the Indian literature regarding botany. This table apparently disorganized and assorted is factually a structured text. The structure is based on the science of lexicography. The introduction to the work found in earlier passages shows the structure of the text in totality. The botanical sources found in *vanaushadhi varga* is assorted and is a historical source which sheds light on the kinds of plant species available during *amara's* period. The table provided above is with English or Latin names and is a clue to what was available, then and also today. This dictionary based work is only a motivational factor for the scholars in India and all over the globe to do more research on the ideas developed in the scientific discipline with a scientific temperament by ancient Indians.

Chapter 4:

Introduction to the Indian plants: its uses as medicines and life-tools

Introduction:

Undoubtedly, the so called lofty and aloof, yet bold from within, the Eastern philosophical speculations and fanciful popular notions always have an edge over the so called advanced or advancing western science. The current Western science is just in its nascent state. To substantiate whatever has been told above, the hymns of the *vedas*, the texts of the *upanisats*, the *itihāsas* and *purānas*, the Buddhist and Jaina canonical works and commentaries, the medical treatises of *caraka* and *suśruta*, the lexicon of *amara* and such many other works yield us plenty of ground-breaking materials, which are indeed beacon lights on how the knowledge of plants and trees and plant and tree-life was clearly acknowledged, and the botanical science was precisely developed on the same lines by the aboriginals of India or East in particular.

The information culled from these sources can be chiefly considered under the following heads

- 1 Germination of seeds
- 2 Morphology External, i.e., general description of plants
- 3 Morphology internal or histology
- 4 Physiology
- 5 Nourishment
- 6 Absorption, transport, transpiration and assimilation of food
- 7 Planting
- 8 Manuring

Plants and plant-life

- 1 Treatment of plants
- 2 Respiration (Breathing)

- 3 Movement irritability
- 4 Growth
- 5 Age and death
- 6 Consciousness in plants
- 7 Sexuality
- 8 Reproduction
- 9 Heredity
- 10 Ecology- study of plants in their natural surroundings (homes),

Taxonomy

- 1 Nomenclature or the naming of plants
- 2 Classification or the grouping of plants based on
 - (a) Botanical principles
 - (b) Medicinal properties
 - (c) Diet values

Plants and evolution

Miscellaneous application of the study of the science of plant-life

- 1 As a means of Economic predictions
- 2 As a means of ascertaining the presence of water in a dreary region

The beginning of relationship between humans and plants can be traced back to the beginning of the earth or precisely after the evolution of the human form. The people have cultivated crops including wheat, barley, millet, dates, vegetables, melon and other fruits and cotton, worshipped trees, glazed their pottery with the juice of plants and painted them with a large number of plant designs. They also knew the commercial value of plants and its products. Thus there are more than sufficient indications to show that agriculture, medicine, horticulture, developed to a great extent during the *vedic* period.

३.

In the *vedic* literature we find a large number of terms used in the description of plants and plant parts, both external features and internal structures. Classification of plants and use of manure and rotation of crops were practiced for the improvement of fertility of soil and nourishment of plants, about which further in the same chapter references will be shown. *Rgveda* mentions that vedic-time people had knowledge about the food manufacture, the action of light on the process and storage of energy in the body of plants. In the post-vedic literatures there are enough evidences to show that botany developed as an independent science on which was based the science of medicine (as embodied in the *charaka* and *suśruta samhitās*), agriculture (as embodied in the *kṛśiparāśara*) and arbori-horticulture (as illustrated in the *upavana-vinoda* as a branch of botany). This science was known as the *vrksāyurveda*, also compiled by *parāśara*.

The thirst for knowledge has been the foremost tendency inherent in man, had it been in the past, present or in the future, which has been and will continue to help a lot in the advancement of human learning and his understanding of the nature. His attention must, first of all, have been drawn towards the things around him such as the vegetations, animals and celestial bodies. In this connection it will not be incorrect to say that when suffering from thirst and hunger, if any homopiens had swallowed certain vegetation and perchance had his hunger been satisfied, incidentally this would have been the foremost utility of vegetation. Similarly, had any human being applied some vegetation on his wound or used it internally during his suffering and was cured, and then this would have been the starting point of science of medicine.

The term used in the *rgveda* and later *samhitās* for tree is *vrksa*, while the general name for plant is *virudha*. Plants, which have healing properties or plants comprising of medicinal use, are called *osadhih*. Whereas, creeping plants have been given the name *libuya* or *vrataṭi*.

The most celebrated plant that finds frequent mention in *rgveda* and later *samhitās* is *soma* plant. The vedic people hail *soma* as the lord of the forest (*vanarāja*). In fact, the whole of the ninth *mandala* of the *rgveda* and six hymns in other *mandalas* are devoted to eulogizing the *soma* plant, and its intoxicating and the invigorating juice (*somarasa*).

The botanical identity of *soma* plant, however, has not been possible till today. The probable candidates are Ephedra (A Gymnosperm), Sarcostemma (flowering plant), and Mushroom (a fungus). The absence of specific description of the *soma* plant in *vedas* perhaps indicative of the fact that the name was used to denote more than one plant that provided the intoxicating drink.

The peepal or the *asvattha* (*Ficus religiosa*) a familiar plant was well known in *vedic* period. The *rgveda* refers to the utensils and vessels fashioned out of the wood of the *Asvattha*. The berries of *asvattha* constituted food for various birds¹¹⁸. The banyan tree (*Ficus bengalensis*) or *nyagrodha* is referred to in the *vedas*. Etymologically, *nyagrodha* means that which grows down, probably indicating the downward growth of the prop roots. The wood of banyan was used for making sacrificial bowls (*camasa*).

Some of the other trees that find mention in the *vedas* are

- I *śālmali* (*Ricum*)
- II *khadira* (*Acacia catechu*)¹¹⁹
- III *śimsupa* (*Dalbergiasissoo*)
- IV *vibhītaka* (*Terminaliabellerica*)¹²⁰

¹¹⁸ यदी सुताम इन्दवोऽभि प्रियममन्दिपु । आपो न धायि सवन म आ वसो दुचा इवोप दाशुपे ॥ सुकिशुक शल्मलि विश्वरूप हिरण्यवर्ण सुवृत्त सुचक्रम् । आ रोह सूर्ये अमृतस्य लोक स्योन पत्ये बहत्तु कृणुष्व ॥ R V 5.03 and 10.85.20

¹¹⁹ ब्राह्मणो जज्ञे प्रथमो दशशीर्षो दशास्य । म मोम प्रथमः पपौ स चकारारस विपम् ॥ A V 4.61

- V *śamī* (Prosopis spp)
- VI *plaksa* (Ficus infectoria)¹²¹
- VII *iksu* (Saccharum officinarum) finds a mention as a cultivated plant in the *atharvaveda*, *maṭi āyanasamhitā*, and other texts

Indians had known a number flowers and flower-bearing plants with, which they were familiar during their performance of rituals. In this context, the *rgveda* refers to *parnopalāsā* (Butea monosperma), also known as *kimsuka* during the *vedic* time. The flowers of this tree were used for adorning the bridal car¹²². Two varieties of lotus white (*pundarīka*) and blue (*puskara*) have been described in *rgveda*. The name *puskarini* (for lakes) perhaps owes its origin to harbouring blue lotus. *Athrvaveda* also mentions the white lily (*kumuda*).

Written records, in the form of manuscripts, are available in *sanskrtam* and several other Indian languages. *Sanskrtam* literature includes the *vedas*, the *upanisats*, and epics like the *rāmāyana* and the *mahābhārata*. The lay literature includes prose, poetry, and drama of a number of *sanskrtam* authors like *māgha bhavabhūti* and *kālidāsa*, in whose works the information on plants is incidental and given by way of comparison. Technical literature comprises medical works like the *charaka* and *suśrutasamhitā*, lexicons like *medinīnighantu* and *amarakośa*, as well as the encyclopedic works like *arthaśāstra* and *brhatsamhitā*. These works generally give excerpts of botany or what is known as *vrksāyurveda*. In addition, there are a number of exclusive works under the title of *vrksāyurveda*. *Paraśara's vrksāyurveda* is supposed to be the most ancient work in actual botany, to have been composed during first century BC and first century AD.

¹²⁰ न स स्वो दक्षो वरुण धृति सा मुरा मन्युर्विभीदको अचित्ति । अस्ति ज्यायान्कनीयस उपारे स्वप्नश्चनेदनृतस्य प्रयोता ॥^{R.V 7.86.6}

¹²¹ भद्रात् प्लक्षान् निम् तिष्ठस्य अश्वत्थात् खदिराद् धवात् । भद्रान् न्यग्रोधात् पर्णात् सा न एह्य अरुन्धति ॥^{A.V 3.3}

¹²² मुकिशुक शल्मलि विश्वरूप हिरण्यवर्ण सुवृत मुचक्रम् । आ रोह सूर्ये अमृतस्य लोक स्योन पत्ये बहत्तु कृणुष्व ॥^{R.V 10.83.20}

From the literary evidence it is clear that even in the First Millennium BC, botany was fully systematized and taxonomy well developed

Plants classification in the vedas:

The *vedas* contain within themselves all the knowledge needed by mankind, They throw “the fullest necessary light on all matters which any aspiring seeker after knowledge can possibly seek to be enlightened on Like all ancient people, the thinkers of the *vedic* age lived in close amalgam with nature and environment The *vedic* literature abounds in plant wealth

The earliest reference to the medicinal use of plants can be traced to *rgveda*, perhaps the oldest repository of human knowledge *Āyurveda* discusses the remedial properties of various drugs in detail

The very word *veda* has this derivational meaning, i.e., the fountainhead and illimitable store house of all knowledge This derivation, in effect, means, connotes and implies that the *vedas* should contain within themselves all the knowledge needed by mankind, relating not only to the so called spiritual (or other worldly) matters but also to those usually described as purely secular, temporal or worldly and to the means required by humanity as such for the achievement to fall round, complete and perfect success in all conceivable directions and that there can be no adjectival or restrictive epithet, calculated (or tending) to limit that knowledge down in any sphere, any direction or any respect whatsoever In other words, it connotes and implies that our ancient Indian Vedic lore should be all round, complete and perfect and be able to throw the fullest necessary light on all matters which any aspiring seeker after knowledge can possibly seek to be enlightened on It is generally believed that *sanskritam* is a language like any other, except that it is more complicated and dead for all purposes At best, people are willing to admit that it has a great literature and a cultural value at the other end, there are people who consider it as mysterious combination of words to create a religious atmosphere

through prayers, chanting, incantations, etc. But *sanskrtam* is as much more than that and possesses within itself many of the attributes of a great and useful language. It is both a science and an art, combined in one.

As a language, *sanskrtam* has a degree of permanence which no other language has. In olden days, when teaching was oral, there was a need to keep information intact and pass them on from generation to generation, accurately. This led, on one hand, to a strong emphasis towards versification, poetry and phonetics. On the other side, formulae were devised of inventing and converting words in such a way that chances of distortion were kept at a minimum. After *pāṇini's* grammar, *sanskrtam* language was so much standardized that further linguistic development was not possible. By a general consensus the world over, it is well recognized that *sanskrtam* literature, as it exists today, is the least distorted of all the languages.

The *ṛgveda* and other literary compositions have come to us as they were at the beginning. Only in *sanskrtam* language we get the sophistication to express the same thought in many ways, what in mathematics is known as 'onto' or 'many-to-one', mapping. For every statement, there is more than one meaning to that statement, and that gives certain iridescence to the language. This gives rise to prose, poetry, music, dance etc. It also leads to a process by which imagination is brought in as in mythology. If we concede that mythology is a language, no, "a higher language that ordinary words cannot express," then *sanskrtam* must have a high degree of sophistication since *sanskrtam* mythology is vast, rich in imaginative symbolism and even profound at times.

Sanskrtam reflects the aspirations and thoughts of the people who use it. In *sanskrtam*, in the *Ramayana* and the *Mahabharata* each and every character reflects some aspect of life, even modern life. However, *sanskrtam* is just not merely a language, 'It is the poetic testament of the genius of a race and a culture and the living embodiment of the thoughts and fancies that have molded them. It represents a total integrated culture which is known as Indian culture. Indian culture is

everything that has come to us from *śrīnagara* to *kanyākumārī*” There is a common culture in this country which is visible when one studies *samskr̥tam* because the marks of *samskr̥tam* are found everywhere This culture is so powerful and viable that it has remained alive and unbroken over a period of nearly five thousand years It is a singular idiosyncrasy of *samskr̥tam* language that the very word (*samskr̥ti*) means culture

Samskr̥tam was once a very effective vehicle for conveying scientific thoughts and it has a rich scientific literature apart from works of art, philosophy, religion, law etc Like all ancient people, the thinkers of the *vedic* age lived in close amalgam with nature and environment They obtained their food, fabricated their implements and searched remedies for illness from plants and animals around them To these they gave some names to identify them, observed their growth and performance and studied their properties

The *vedic* literature abounds in plant wealth In the days of yore, our forefathers settled in the land of five rivers, as the pioneer heralds of civilization They used to recite the *vedic* hymns in praise of the supreme creator for his merciful manifestations in the medicinal plants which were important for restoration of public health The earliest reference to the medicinal use of plants can be traced to *ṛgveda*, perhaps the oldest repository of human knowledge *Āyurveda* discusses the remedial properties of various drugs in detail The following preliminary data bear witness to vast resources of research in *vedic* plants In *vedic* writings broadly, the plant world is divided into trees, shrubs, herbs, creepers and grasses¹²³ *Vṛkṣa* denotes trees in *ṛgveda*¹²⁴ and *vīrudha* and *osadhi* is the term for minor vegetable

¹²³ या फलिनीर्या अफला अपुष्पा याश्च पुष्पिणी । बृहस्पतिप्रसूतामता नो मुञ्चन्त्वहम् ॥ तयोरन्य पिप्पल म्वाद्रत्यनश्नन्नन्यो
अभि चाकशीति ॥ यस्मिन्बृक्षे मध्वद मुपर्णा निविशन्ते मुवते चाधि विश्वे । तस्येदाहु पिप्पल स्वाद्वग्रे तन्नोन्नशद्य पितर न वेद
॥ R V 10 97 15 । 164 20 & 22

¹²⁴ त्वे अग्रे विश्वे अमृतासो अहुह आसा देवा हविरदन्त्याहुतम् । त्वया मर्तासि स्वदन्त आसुति त्व गर्भो वीरुधा जज्ञिषे शुचि ॥
अध्वर्यवो यो अपो वन्निवास वृत्र जघानाशन्येव वृक्षम् । तस्मा एत भरत तद्वशायै एष इन्द्रो अर्हति पीतिमस्य ॥ अस्माक

carpet of herbs The medicinal plants possessed tremendous healing power where as those classified under *vīrudha* did not display curing properties Grasses are *trna*¹²⁵ *Atharvaveda*¹²⁶ presents an elaborate classification of plants Nyagrodha characterizes *Ficusindica* which sends down growing root like branches from their robust horizontal twigs The vegetation types are, *khīla* or *khūlya* is the waste land, *gavyūti* means grassland for grazing of cattle and *dhanvan* specified the desert¹²⁷ Plants were classified on the basis of their external form, medicinal properties and environmental associations At least in some cases the *hindu* sages were also using a binomial system of nomenclature of plants Different categories of plants are distinguished in the *vedas*, namely *alasala*-which means spread on the ground, *pratanvaī* - creeper, *stambhinī* - a bushy plant, *vrataī* - a gigantic climber, *amśumālī* - a spreading herb, *sasa* - an erect herb, *viśākhā* -a shrub with spreading branches; and *vrksa*, *vana* and *druma* - trees The main plant organs are expressed in *rgveda* These are fruit- *phala*, flower - *puspa*, twig - *valśa*, stem - *kānda*, panicle - *tūla* and root - *mūla* In the *rgveda śākhā* is the branch of a tree but *vāya* is more

मित्रावरुणावत रथमादित्यै रुद्रैर्वसुभि सचाभुवा । प्र यद्वयो न पतन्वस्मनस्परि श्रवम्यवो हृषीवन्तो वनर्षद ॥^{RV 2114 2142 & 391}

¹²⁵ किमु श्रेष्ठ कि यविष्ठो न आजगन्किमीयते दूत्य कद्यदूचिम । न निन्दिम चमस यो महाकुलोऽग्रे भ्रातर्दृण इद्भूतिमूदिम ॥^{RV 11611}

¹²⁶ प्रस्तृणती स्तम्बिनीर् एकशुङ्गा प्रतन्वतीर् ओषधीर् आ वदामि । अशुमती कण्ठिनीर् या विशाखा हवयामि ते वीरुधो वैश्वदेवीर् उग्रा पुरुषजीवनी ॥ यत्राश्वत्था न्यग्रोधा महावृक्षा शिखण्डिन । तत् परेताप्सरस प्रतिबुद्धा अभूतन ॥ भद्रात् प्लक्षान् निस् तिष्ठस्य अश्वत्थात् खदिराद् धवात् । भद्रान् न्यग्रोधात् पर्णात् सा न एह्य अरुन्धति ॥^{AV 874 4374 505}

¹²⁷ आ नो मित्रावरुणा धृतैर्गव्यूतिमुक्षतम् । मध्वा रजामि मुकूत ॥ ता वामेषे रथानामुर्वी गव्यूतिमेषाम् । रातहव्यस्य सुष्टुति दधृक्स्तोमैर्मनामहे ॥ अन्तिवामा दूरे अमित्रमुच्छोर्वी गव्यूतिमभय कृधी न । यावय द्वेप आ भरा वसूनि चोदय राधो गृणते मघोनि ॥ त्वया हितमप्यमप्सु भाग धन्वान्वा मृगयसो वि तस्थु । वनानि विभ्यो नकिरस्य तानि व्रता देवस्य सवितुर्मिनन्ति ॥ आ मन्द्रैरिन्द्र हरिभिर्याहि मयूररोमभि । मा त्वा के चित्रि यमन्वि न पाशिनोऽति धन्वेव तौ इहि ॥^{RV 125 36216 5663 7774 2387 3451}

often used¹²⁸ The word *valśa* (twigs) occurs as *śatavalśa* (having hundred twigs) and *sahasravalśa* having a thousand branches)¹²⁹

Evidences from the early *vedic* profiles (2500 B C) permeate that the science of medicinal plants were well developed in those days *Suśrutha-samhitā* contains a comprehensive chapter on therapeutics *Caraka-samhitā* gives a description of the materamedica known to the ancient *hindus* Since disease, decay and death always co-exist with life, the primitive man utilized as the therapeutic agents those plants which he could procure easily *Vedas*, the oldest books of knowledge in the library of mankind, offer wonderful records of such medicines According to these, *soma*, *madhu* and *sura*, the fermented juices of the plants, were highly extolled and even worshipped Soma is cited in a hymn as “The strength of this ambrosia (*amrtam*) do we give this man to drink Moreover, I prepare a remedy so that he may live four hundred years ” Even *Rauwolfia*, which has now been rocketed to world wide popularity finds a devoted mention in ancient and monumental manuscripts where the plant is called *sarpagandha* in *sanskrtam* as an (*rambana*) antidote against insanity This plant is acclaimed as a useful therapeutic weapon against high blood pressure and psychiatric disorders

There is ample proof of applications of various recipes of Indian herbs in curing many a malady and realization of herbal charms led to the development of *āyurvedic* system of medicine *Caraka* and *Suśrutha-samhitās* constitute two important sections dealing with drug plants of ancient India With the arrival of Western therapy, glories of *āyurvedic* medicine rapidly declined But recently there is a revival of reference to the plant products as it has no side effects

¹²⁸ साकं हि शुचिना शुचिं प्रशाम्ना क्रतुनाजनि । विद्वोऽस्य व्रता ध्रुवा वया इवानु रोहते ॥ अवोध्यग्निं समिधा जनानां प्रति धेनुमिवायतीमुपासम् । यद्वा इव प्र वयामुज्जिह्वाणां प्र भानवः सिद्धते नाकमच्छ ॥ वैश्वानरस्य विमितानि चक्षमा सानूनि दिवो अमृतस्य केतुना । तस्येदु विश्वा भुवनाधि मूर्धनि वया इव रुरुहुः सप्त विसृहुः ॥^{RV 25.4.51 1 676 131}

¹²⁹ वनस्पते शतवल्शो वि रोहः सहस्रवल्शा वि वयं रुहेम । यत्त्वामयं स्वधितिस्तेजमानः प्रणिनाय महते सौभगाय ॥^{RV 38.11}

Vedic plants and tree species:

A lot of plant species as found in different scriptures of the ancient lore will be enlisted here along with their uses either to the current times or just as an information as to how it was used in the earlier times

- अर्क - *Calotropis gigantea*

This plant has synonyms like *ksīraparni*, *sūryahaya*, *viksīra*, *alarka*, *vāsuka*, Etc There are three kinds of varieties available in India

In the *śathapatha brāhmaṇa*¹³⁰ the leaf of the plant has been closely related to lord *śiva* In the *śatharudra* sacrifice sticks produced out of this plant has a very vital role in generating the sacrificer the desired fruits

In the *taittirīya samhita* references are found for the same and more interestingly the references show the birth of this plant¹³¹ It says craving to earn a spot in the heaven and in a hurry, sage *angīrasa*, after the fructification of the the sacrifice, carelessly spilt a preparation (which was mixed with boiling hot milk and some curds in a vessel named *mahāvīra*) on a goat and that starting moaning out of pain After a while intense goose bumps caused the falling of the hairs on its body The heated preparation actually ripped the skin off and a part of it fell upon the ground and this gave birth to *Calotropis Gigantea*

The use of this particular plant is mentioned in the *vedas*, in the context of performance of *navagrahahoma*¹³² The larger leaves of this plant are used for sacrificial purposes The medicinal properties of this plant are seen in curing leprosy, elephantiasis, syphilis and many others The flowers are considered

¹³⁰ S B 9 1 1 42

¹³¹ अङ्गीरसस्सुवर्गं लोकं यन्तोऽजाया धर्मम् प्राप्सीच्छन् सा शोचन्ती पर्णं पराजहीत मोऽर्कोऽभवत्।

¹³² यथासितं प्रथयते वशाम् अनु वपूषि कृण्वन् असुरस्य मायया । एवा ते शेषं महसायम् अर्को ङ्गेनाङ्गं ससमकं कृणोतु ॥^{A V}
1 72 1 S B 9 1 1 49

digestive, stomachic, tonic and useful in curing cough, cold, asthma, catarrh and loss of appetite. The root bark is said to promote the secretion and to be useful in skin diseases, enlargements of the abdominal viscera, intestinal worms, cough, ascites and anasarca. The milky juice is regarded as a drastic purgative and caustic and is generally used as such in combination with the milky juice of *Euphorbia Nenifolia*. The leaves mixed with rock salt roasted within the closed vessels so that the fumes may not escape. The ashes thus produced are given with whey in ascites and enlargement of the abdominal viscera. The following inhalation is prescribed for cough, soak the powdered root of this plant in its own milky juice and dry. Bougies are then prepared from the powder, and their fumes inhaled. The root bark, reduced to a paste with rice vinegar is applied to elephantiasis of the legs and scrotum. The milky juice of this plant and *Euphorbia Nenifolia* are made into tents with the powdered wood of *berberies asiatica*, for introduction into sinuses and fistulae. The milky juice is applied to carious teeth for relief of pain. An oily preparation made by boiling together eight parts of sesamum oil, sixteen parts of calotropic oil and one part of turmeric is said to be useful in eczema and other eruptive diseases. In the concan the milk with the powdered mustard is applied as a lap to rheumatic swellings and the flowering tops pounded and boiled with molasses, are given in doses of about one drachm every morning as a remedy for asthma. In want of virility the following prescription is in vogue- 125 flowers are to be dried and powdered and then mix it with one tola each of cloves nutmegs, mace and pellitory root and make into pills and has to be taken daily dissolved in milk.

If an iron tool is kept in liquor prepared out of *yavaksara*, or milky sap of *arka* and then in a mixture of *sankola* oil and water, it doesn't blunt while splitting a boulder or iron, nor does its tip bend.

- अर्जुन – *Terminalia arjuna*

This plants has synonyms like *nadīsarja vīrataru*, *indradrume kakubha*, *śambara*, *pārtha*, *citrayodhi*, *dhanañjaya*, *vairāntaka*, *kirīti*, *gāndīvi*, *śivamallaka*, *savyasāci*, *karnāri*, *karavīraka*, *vīra*, and *dhavala*

In the historical texts of India, i.e., *īāmāyana* and *mahābhārata* this tree is noted by the writers of both the authors. In the *īāmāyana* it is in the *yuddhakāṇḍa*. Other mythology like *matsyapurāṇa*, scientific treatise *brhatsamhitā*¹³³ and even in the *arthaśāstra* of *chāṇakya* the mentioning of this tree is found.

The uses of this tree is many fold as the pulp of the tree's stem and branches itself are so strong and sturdy that it supports the construction of boat, and other equipments of farming. This tree when planted on the highways is of great help as a shade-giver and this tree is renowned in the ancient scriptures as a shade-giver. Kings have used this tree in the past for the very purpose as told above. But, this tree is inauspicious to be planted nurtured and nourished around a residential place¹³⁴. But very interestingly one verse says this tree increases the amount of rain¹³⁵, which actually in a way substantiates the idea of having the 'tree planted in plenty' across the highway and other parts of the town which can not only add the value of beauty of the town but also make it a place of rest and shade. The logic 'more trees more rain' is hence proven. A similar thought in different set of words has been articulated by the author of *kāśyapīyākṛsisūkti* – the tree's leaves, flowers and fruits are benefactors of mankind and especially for the birds¹³⁶.

¹³³ B S 29 11, 53 4, 53 12, 102, 105

¹³⁴ आसन्न कण्टकी वर्जन चेष्टम्^{V A 30}

¹³⁵ आग्नौलैन सनावृष्टि^{V A 323}

¹³⁶ तिन्दुकास्तिलका पुत्रगाश्चयेत्, वशा काशारूच फलेरपि, फलप्रदा परिकीर्तिता^{K K S 400 401 402}

This tree is as per *cakradatta* describes it as tonic, astringent and cooling and prescribes it in heart disease and for those purposes for which astringent are generally applied. He recommends it to be given in milk, treacle or water when used internally, or as a clarified butter made with the decoction and powder of the bark. Physicians of the ancient India think that bark has some special virtue in promoting the union of fractures and the dispersion of ecchymosis when given internally. It is considered to be lithontriptic and a reference to the chemical composition will show that the ash of the bark contains an extraordinary large proportion of calcium carbonate. Externally it is used in the form of an astringent wash to ulcers.

- औदुम्बर – **Ficus racemosa**

The other names of *udumbara*, *udumbara*, *vrksa*, *ksīravrksa*, *hemavdugdha*, *sadāphala*, *kālaskandha*, *yajñīya*, *yajñayogya*, *supratisthita*, *śītavalka*, *jantuphala*, *puspaśūnya*, *pavitārika*, *saumya*, and *śītaphala*.

The *vedic* reference is found in *atharvaveda*¹³⁷. The folklore says for fortification of the cattle the pearl of the tree is used as a special case. This is the pillar or the thick stick to which the sacrificial animal is tied during the *vedic* sacrifices. Apart from this *khadū* a *bilva* *palāśa* *udumbara* *vibhūta* and *aśvattha* trees are also used as the pillar.

The classic etymology of this tree is उन्नतत्वात् लङ्घितमम्बरमनेनेत्युदुम्बर ।

There is a narration in the *taittirīya brāhmaṇa* about the birth of the tree¹³⁸, which says that the gods and goddesses once were indulged in distributing amongst themselves the substance of all the most important and vital objects in the universe.

¹³⁷ औदुम्बरेण मणिना पुष्टिकामाय वेद्यसा । पशूणा सर्वेषा स्फाति गोष्ठे मे सविता करत् । ^{AV 1931}

¹³⁸ देवा वा ऊर्जं व्यभञ्जत । तत उदतिष्ठत् । ^{TB 113}

At the end the substance of all the substances when put together fell on the ground and hence it is called औदुम्बर .

The story found in the aforementioned text says lord *saraswati* was once hiding in the tree and hence this shows her special love for the tree This is also called *saraswati's* dwelling place¹³⁹

He who himself plants eight *udumbara* trees or even prompts someone to plant them, rejoices in the lunar world¹⁴⁰

A proverb says one can after frantic search find the flowers of this tree, a white crow and even a footprints of a fish but never understand a women's mind¹⁴¹

In the *vedas* and in specific the *aitareya* branch talks about the tree as a highly respected and applauded because it is food in itself and source of energy¹⁴²

This tree is used as a bowl to store the *havis* and the same is given to the lord of death¹⁴³

There is a very interesting description which can be perhaps obsolete from today's world's structural perspective But still as an essential element of this work, this piece of information from *viśwavallabha* is culled If *bilva* and *udumbara* are found in combination near an anthill water exists at the depth of three and a half man-heights to its south at a distance of three hands, and a frog is an indication If,

¹³⁹ वाग्वै देवेभ्योऽपाक्रामद्यजायातिष्ठमाना सा वनस्पतीन् प्राविशत् मैषा वनस्पतिषु वसति। TS 2.1.3

¹⁴⁰ उदुम्बरद्रुमानष्टौ रोपयेत्स्त्रयमेव य । प्रेरयेत् रोपणायापि चन्द्रलोके स मोदते॥ VA 18

¹⁴¹ औदुम्बराणि पुष्पाणि श्वेतवर्णं च वायस। मत्स्यपाद जले पश्येन्न नारीहृदयस्थितम्॥ KKS 399

¹⁴² औदुम्बरो भवति। अन्नं वाऽऽर्गुदुम्बरऽऽर्ज्योऽन्नाद्यस्याऽवरुद्धै तस्मादौदुम्बरो भवति। अथ यदौदुम्बराण्यूर्ज्यो वा एपोऽन्नाद्याद्वनस्पतिरजायत मधूदुम्बरो। भाज्यं च वनस्पतीना क्षत्रे TS 5.11.7

¹⁴³ औदुम्बरेण पात्रेण यूष्णो मृत्यवे ग्रहं गृह्णाति। TB 1.10.8

however, *kakodudumbara* is close to an anthill, water exists at the depth of three man-heights to its west and at the depth of half a man-height, the rock is white and so is the soil¹⁴⁴

Lot of other *ślokas* from the same source use the tree as a cue to find out the depth of water and also the existence of water in various types of lands¹⁴⁵ The same text deals with the idea of auspicious tree and inauspicious tree and hence in one context *udumbara* is considered as the most auspicious only if planted to the south of the village or town one community is living¹⁴⁶ It is to be avoided to the north of the village¹⁴⁷ Further it is told that the soil required to grow such a tree need not be of a very special quality as it can grow in a mountain or rocky terrain as well¹⁴⁸ The most interesting idea discussed here is that the decoction prepared of this plant has to be served as manure to the trees suffering from phlegm¹⁴⁹ The best available information regarding its medicinal value is the one found below- scrape the trunk of a tree from where the branches shoot off Insert the mixture of *guñja*, *madhu*, *udumbara*, sugar, clarified butter and *madhuka* along with the calf dung to produce seedless fruits¹⁵⁰

Root is used in dysentery, pectoral complaints, diabetes, applied in mumps, other inflammatory glandular enlargements and hydrophobia The bark is highly efficacious in threatened abortion and also recommended in urological disorders, diabetes, hiccough, leprosy, dysentery, asthma and piles The leaves are good wash

¹⁴⁴ काकौदुम्बरिका यदास्ति गौरादृशन् मृत्तथा^{V V 1A 13}

¹⁴⁵ पशाणाद्यन्तर वीक्ष्य शास्त्राणि शस्वत्, एतान्निश्चित साधारणे पर्वत, वारुण्य त्रिभिर्दुर्दुर^{V V 1E 2 4 & 9}

¹⁴⁶ शुभ प्राच्या न विवर्जयेत्^{V V 3 25}

¹⁴⁷ वर्जयेत् अमूत्रे^{V A 26}

¹⁴⁸ उदुम्बरीति सम्भवन्ति^{V V 4 4}

¹⁴⁹ प्लक्षार्जुन वासघनरोहितानाम्^{V V 8 21}

¹⁵⁰ गुञ्जा मधु स्यात् फल अस्थि वर्ज्यम्^{V V 9 41}

for wounds and ulcers. They are useful in dysentery and diarrhoea. The infusion of bark and leaves is also employed as mouth wash to spongy gums and internally in dysentery, menorrhagia, effective remedy in glandular swelling, abscess, chronic wounds, cervical adenitis and haemoptysis. Tender leaves are used in bilious affection and also to improve skin complexion. Tender fruits are astringent, stomachic, refrigerant, dry cough, loss of voice, diseases of kidney and spleen, astringent to bowel, styptic, tonic, useful in the treatment of leucorrhoea, blood disorder, burning sensation, fatigue, urinary discharges, leprosy, menorrhagic, epistaxis, intestinal worms and carminative. They are useful in miscarriage, menorrhagia, spermatorrhoea, epididymitis, cancer, myalgia, scabies, haemoptysis, intrinsic haemorrhage, excessive thirst, visceral obstructions. Latex is aphrodisiac and administered in hemorrhoids, diarrhoea, diabetes, boils, alleviates the edema in adenitis, parotitis, orchitis, traumatic swelling, toothache and vaginal disorders.

- अश्वत्थ – **Ficus religiosa**

The synonyms of this tree *aśvatthavṛkṣa*, *pippala*, *bodhidruma*, *ckuñjarāsana*, *calapatra*, *acyutāvāsa*, *pavitraka*, *śīmān*, *ksīradruma*, *vīpra*, *māngalya*, *śyāmala*, *guhyapuspa*, *satyaśucadruma*, *dhauvrkṣa* and *catyadruma*.

This tree has its relevance in a religious manner. It is extremely pure and hence its meaning and significance to people in their life is sanctified. The *vedic* references to this tree is umpteen^{151 152 153 154}

¹⁵¹ अत्राह तद्वहेथे मध्व आहुति यमश्वत्थमुपतिष्ठन्त जायवोऽस्मे ते सन्तु जायव । साक गाव सुवते पच्यते यवो न ते वाय उप दस्यन्ति धेनवो नाप दस्यन्ति धेनव ॥ R V 1 135 8

¹⁵² द्वा सुपर्णा सयुजा सखाया समान वृक्ष परि षस्वजाते । तयोरन्य पिप्पल स्वाद्वत्त्यनश्नन्नन्यो अभि चाकशीति॥

R V 1 135 20

In *atharvaveda*¹⁵⁵ a *mantra* is found which says- in a place where there is ficus religiosa and peacock there the damsels without intimation come and live unidentified by anyone In *yajurveda* the *mantra* goes on to say, not just damsels, even the angels lie in such place

In *taittirīya brāhmaṇa* the idea of how the naming of this tree happened is mentioned in this fashion- *agni* transformed himself to a horse and exiling himself for an year from the gods and goddesses went into a tree and concealed So that tree in which the *agni* hid is known to be *aśwattha*¹⁵⁶

In the same text¹⁵⁷, in the later verses the *agni* has been replaced with *prajāpati*

In the famous *mantra* of the *yajurveda* wherein seven tongues of fire has been mentioned, the seven *samits* are also mentioned Among the seven *samits*, *aśwattha* is one¹⁵⁸

भद्रात् प्लक्षान्निस्तिष्ठस्यश्चत्थात् खदिराद् धावत्। भद्रा न्यग्रोधात् पर्णात् सा न एह्यरुन्धति॥¹⁵⁹

This *mantra* is a very rarest of the *mantras* in which the use or the benefit of the tree is directly found It says- there are a lot of trees mentioned with ficus religiosa and are requested to come with us as medicines

एते वै त्रयो बक्षा राजन्निति न्यग्रोधस्यावरोहश्च फलानि च उदुम्बराण्याश्चत्थानि
प्लाक्षाण्यभिषुणुयात्तानि भक्षयेत्सोऽस्यष्टो इव हि देवा ॥¹⁶⁰

¹⁵³ पुमान् पुंस परिजातो श्वत्थ खदिराद् अग्निः । स हन्तुं शत्रून् मामकान् यान् अहं दत्वेष्मि ये च माम्॥ AV 361

¹⁵⁴ अथ यदनाशकायनमित्याचक्षते ब्रह्मचर्यमेव तदेष ह्यात्मा न नश्यति य ब्रह्मचर्येणानुविन्दतेऽथ यदरण्यायनमित्याचक्षते ब्रह्मचर्यमेव तदरश्च ह वै ण्यश्चार्णवौ ब्रह्मलोके तृतीयस्यामितो दिवि तदैर मदीयं सरस्तदश्वत्थ सोमसवनस्तदपराजिता पूर्ब्रह्मण प्रभुविमितं हिरण्मयम्॥^{CU 853}

¹⁵⁵ यत्राश्वत्थन्यग्रोधा महावृक्षा

¹⁵⁶ अग्निर्देवेभ्यो निजायत अश्वो रूपं कृत्वा । सोऽश्वत्थे सवत्सरमतिष्ठत तदश्वत्थस्याश्वत्थत्वम्॥^{TB 113}

¹⁵⁷ TB 3812

¹⁵⁸ सप्त ते अग्ने समिधस्सप्त जिह्वा इत्याह सप्तैवास्य सप्तानि प्रीणाति।^{TS 3.47}

¹⁵⁹ AV 555

This *mantra* states that the king has to extract the juice of the above mentioned trees and drink as the part of the fire ritual

यथाश्वत्थानि तेजसा वा एष वनस्पतिरजायत यदश्वत्थ परिशिष्यात्॥

The kings should also extract the juice of the above mentioned tree's fruits as it will assist them in developing a very effulgent look

A famous saying in *samskrtam* which has no reference says- what is the use of practicing austerity, offering or donating things to the needy or even the best of the righteous activities?, if you cannot plant ficus religiosa the *asvattha*?¹⁶¹

The sanctity of the tree as seen by major *hindus* is shown through the famous *mantra*-

मूलतो ब्रह्मरूपाय मध्यतो विष्णुरूपिणे। अग्रत शिवरूपाय वृक्षराजाय ते नम ॥

अकारमूलरूपेण उकारस्तम्भशाखिने। मकारफलपुष्पाय वृक्षराजाय ते नम ॥

He, who plants even a single *aswattha* wherever it may be as per the prescribed mode, will go to the abode of *hari*¹⁶² By planting one tree in one's life time, one will never go to the hell¹⁶³ The plant shouldn't be planted to the East of the village¹⁶⁴ The *aswattha* tree is an indication of the land's ability to produce all types of crops¹⁶⁵

¹⁶⁰ A V 7 5 30

¹⁶¹ यज्ञै कि बहुभिर्दानै तपोभिस्तीर्थसाधनै । अरोपिते वते नृणा साक्षाच्छङ्करविग्रहे॥

¹⁶² एकमेव हि योऽश्वत्थ रूपयेद्विधिना नर । यत्र कुत्रापि वा स्थाने गच्छेत्स भवन हरे ॥^{V A 11}

¹⁶³ अवस्पृष्टामेक न पश्येत्^{V A 25}

¹⁶⁴ वर्जयेत् वरमुत्तरे^{V A 26}

¹⁶⁵ न्यग्रोधेन सर्धन्नस्यानम्^{V A 320}

यदश्वत्थद्वयं साम्राज्यं वा एतत् वनस्पतीनाम्।¹⁶⁶

Among the trees *aswattha* is considered to be the king

Many plants synthesize substances that are useful to the maintenance of health in humans and other animals. A number of traditions came to dominate the practice of herbal medicines for various effective human benefits at the end of the twentieth century. With a view to increasing the wide spectrum of medicinal usages, the present day requires a new biologically active ointment which exhibit wound healing activity as local applications. Oflate, *Ficus religiosa* (Family- Moraceae) which is commonly known as Peepal tree, is abundantly distributed throughout in India. Even though the bark having wound healing activity, anti-inflammatory, analgesic, anti lipid- peroxidation activity and have purgative properties (tender shoots) but as per our knowledge there is no such literature till available for wound healing activity of leaves extract of title plant in the form of ointment. In spite of modern advanced technologies in the pharmaceutical industry, the availability of market products capable of stimulating the process of wound repair is still limited. Hence there was an investigation which was focused in the direction of establishment of wound healing activity of leaves extract (form of ointments) of *Ficus religiosa*. The conclusion indicates that 70% hydro alcoholic leaf extracts ointment of title plants at both strengths (5% and 10%) exhibited significant wound healing promoting activity. However, this effect was found to be concentration related fashion where 10% ointment promotes significant wound-healing activity by increasing cellular proliferation, formation of granulation tissue, synthesis of collagen and by increase in the rate of wound contraction as compared to the control animals. This was evident by faster rate of wound closure and epithelization period in excision wound model and significant increase in skin breaking strength in incision wound model. Further phytochemical studies are needed where the extract

¹⁶⁶ A B 7 35 6

will be subjected to further fractionation and purification to identify and to isolate the active compound(s) responsible for wound healing activity

Ficus religiosa is a widely branched tree with leathery, heart-shaped, long-tipped leaves, used in the Indian system of medicine, besides which folklore medicine also claims its use in diarrhoea, diabetes, urinary disorder, burns, haemorrhoids, gastrohelcosis, skin diseases, convulsion, tuberculosis, fever, paralysis, oxidative stress, bacterial infection etc Research carried out using different in-vitro and in-vivo techniques of biological evaluation support most of these claims Presently there is an increasing interest worldwide in herbal medicines accompanied by increased laboratory investigation into the pharmacological properties of the bioactive ingredients and their ability to treat various diseases Numerous drugs have entered the international through exploration of ethnopharmacology and traditional medicine Although scientific studies have been carried out on a large number of Indian botanicals, a considerably smaller number of marketable drugs or phytochemical entities have entered the evidence-based therapeutics Efforts are therefore needed to establish and validate evidence regarding safety and practices of *āyurvedic* medicines

- न्यग्रोध - *Ficus banghalensis*

The other names being *vata*, is one more such a tree which is known to be very famous among the *mantras* of the *vedas*^{167 168 169}

क्षत्र वा एतत् वनस्पतीना न्यग्रोध¹⁷⁰ - This tree is also considered as the king amongst the trees It is also known to be the *ksatriya*

¹⁶⁷ अबुध्रे राजा वरुणो वनस्योर्ध्वं स्तूपं ददते पूतदक्ष । नीचीना मथुरुपरि बुध्ना एषामस्मे अन्तर्निहिता केतवः स्युः ॥ R V 1 24 7

¹⁶⁸ यत्राश्वत्था न्यग्रोधा महावृक्षा शिखण्डिनः । तत् परेताप्सरसः प्रतिबुद्धा अभूतनः ॥ A V 4 37 4

¹⁶⁹ न्यग्रोधफलमत आहरेतीदं भगव इति भिन्दतीति भिन्नं भगव इति किमत्र पश्यसीत्यण्व इवेमा धाना भगव इत्यासामङ्गैका भिन्दतीति भिन्ना भगव इति किमत्र पश्यसीति न किञ्चन भगव इति ॥ C U 6 12 1

The other famous references in other major Indian scriptures-

निर्गच्छति जगत्सर्व वटमूले स दृश्यते। हरिश्च भगवास्तत्र प्रजापतिपुरसृत ॥ निर्गच्छति
जगत्सर्व वटमूले स दृश्यते। हरिश्च भगवास्तत्र प्रजापतिपुरसृत ॥¹⁷¹

नमस्तेऽस्तु महावृक्ष पारयन्मे पवित्रतम्। न्यग्रोध तमुपस्थाय वैदेही वाक्यमब्रवीत्।
नमस्तेऽस्तु महावृक्ष पालयन् मे व्रत पति ॥¹⁷²

त्वया पुरस्तादुपयाचितो य सोऽय वट श्याम इति प्रतीत । राशिर्मणीनामिव गारुडाना
सपद्मराग फलितो विभाति॥¹⁷³

वटवृक्षद्वय मृत्योरोपयेद्यो यथाविधि। शिवलोके वसेत्सोऽपि सेवितस्त्वप्सरोगणै ॥¹⁷⁴

By planting a couple of banyan trees as per the prescribed mode would go to
the abode of *śiva* and many heavenly nymphs will attend him

The English poet Southey was inspired by this tree and he writes

“Fifty straight columns propt its lofty head
And many a long depending shoot,
Seeking to strike a root,
Straight like a plummet grew towards the ground
So like a temple did it seem that there
A pious heart’s first impulse would be prayer ”

By planting one *nyagrodha*, one never visits hell¹⁷⁵

This tree should be planted to the east of the village or one’s abode, as a tree
which fulfils all desires of the villagers or the members of a family and it shouldn’t
be planted to the left of the village or one’s abode¹⁷⁶

¹⁷⁰ A B 7 35 5

¹⁷¹ N P U K 63 141

¹⁷² Ramayana- A K 2 55 23 & 24

¹⁷³ R V 13 53

¹⁷⁴ पर ङोका सुखिनो गृहे^{V A 13}

¹⁷⁵ अवस्पृष्टामेकं न पश्येत^{V A 23}

एते वै त्रयो भक्षा राजन्निति न्यग्रोधस्यावरोहाश्च परोक्षप्रिया इव हि देवा ॥¹⁷⁷
तेषा यश्चमसाना रसोवा न्यग्रोधस्यावरोहाश्च फलानि क्षत्रियो यजमान ॥¹⁷⁸

The king in the fire sacrifice should extract the juice of this plant's fruit and become the likeable object of the angels and damsels

The uses of this plant are multifold - *Ficus bengalensis* Linn is a large evergreen tree found throughout forest tracts of India. It is popular indigenous system of medicine like *āyurveda*, *siddha*, *unani* and Homeopathy. In traditional system of medicine various plant parts such as stem bark, root bark, aerial roots, vegetative buds, leaves, fruits and latex are used in dysentery, diarrhoea, diabetes leucorrhoea, menorrhagia, nervous disorders, tonic and astringent. According to *āyurvedic* system of medicine *Ficus bengalensis* Linn (banyan tree) is well known to be useful in diabetes.

The group of four *Ficus*, all yielding latex, according to *āyurvedic* texts, consist of *nyagrodha* (*Ficus bengalensis*), *udumbara* (*Ficus glomerata*/*Ficus racemosa*), *plaksa* (*Ficus lacor*/*Ficus retusa*) and *aśvattha* (*Ficus religiosa*) the bark and leaves of this

group are used as astringent, haemostatic, anti-inflammatory, anti-septic, prescribed in diarrhoea, dysentery, and in the treatment of skin diseases, ulcers, vaginal disorders, leucorrhoea, menorrhagia, deficient lactation.

The wounds of the tree are healed by the treatment of anointing with the paste of the bark of *nyagrodha* and *udumbara*, cow dung, honey and ghee¹⁷⁹

This tree indicates the underground water bed¹⁸⁰

¹⁷⁶ गृहस्य पूर्वं पुत, वर्जयेत् वरमुत्तरे^{V A 24 & 26}

¹⁷⁷ A B 7 5 31

¹⁷⁸ A B 7 5 30

¹⁷⁹ न्यग्रोधो उदुम्बरो नाखिनाम्^{V A 210}

¹⁸⁰ पक्षाणाद्यन्तरं वीक्ष्य शास्त्राणि शस्वत्, एतान्निश्चितं साधारणे पर्वतं,^{V V 1E 2 & 4}

It is planted for soil conservation The timber is used for well-curbs, furniture etc The tree is suitable for paper pulp Leaf (Crude protein 9 63%) lopped for fodder and fruits are used to prepare juice traditionally

- खदिर - **Acacia catechu**

The other names of this tree is found in multiple lexicons-

- a amarakośa- *gāyatrī bālātanaya dantadhāvana*
- b ratnamālā- *tiktasāra kantakidruma*
- c jatādhārā- *bālapatram suśālya vakrakanta yajñānga sintasālya sāradruma kantī kustārī bahuśāra medhya bālapatra raktasāra kaī katī jihvasālya*
- d śabdaratnāvalī- *kusthahābālapatrakam yūpadruma*
- e ājāvallabha- *khadira śetasāra kadara somavalkala makhaī ema*

अभि व्ययस्व खदिरस्य सारमोजो धेहि स्पन्दने शिशपायाम् । अक्ष वीळो वीळित वीळयस्व मा यामादस्मादव जीहिपो न ¹⁸¹

Enclose thee in the heart of *khadira* timber, in the car wrought of *simsapa* put firmness Show thyself strong, O axle, fixed and strengthened throw us not from the car whereon we travel

पुमान् पुस परिजातो 'श्वत्थ खदिराद् अधि । स हन्तु शत्रून् मामकान् यान् अह द्वेष्मि ये च माम् ¹⁸²

वषट्कारो वै गायत्रियै शिरोऽच्छिनत्तद्वैरस परापतत्य पृथिवी प्राविशत् स खदिरोऽभवत्॥ ¹⁸³

¹⁸¹ R V 3 53 19

¹⁸² A V 3 6 1

¹⁸³ T S 3 5 7

The *vasat* call cleft the head of the *gāyatrī*, its sap fell away, it entered the earth, it became the *khadira*, he, whose dipping-spoon is made of *khadira* wood, cuts off with the sap of the metres, his oblations are full of sap Soma was in the third sky from hence, the *gāyatrī* fetched it, a leaf of it was cut off, that became the *parna* that is why the *parna* is so called.

आग्नेयमष्टाकपाल चरु वारनम्। दशकपाल सारस्वत चरुमाग्रा वैष्णवमेकादशकपालम्॥¹⁸⁴

To *agni* his body goes, to *soma* his sap, - *varuna* grasps him with *varuna's* noose--to *sarasvatī* the speech, to *agni* and *visnu* the body of him who long is ill For him who is long ill or who desires, 'May I live all my days', he should offer this sacrifice, to *agni* on eight potsherds, to *soma* an oblation, to *varuna* on ten potsherds, to *sarasvatī* an oblation, to *agni* and *visnu* on eleven potsherds, verily he ransoms his body from *agni*, his sap from *soma* By the offering to *varuna* he frees him from *varuna's* noose, by the offering to *sarasvatī* he bestows speech, all the gods are *agni*, the sacrifice is *visnu*, verily by the gods and the sacrifice he heals him, even if his life is gone, he yet lives 'What went new, that became fresh butter', (with these words) he looks upon the butter, verily he describes its form and greatness 'Thou art the breath of the *āśvins*', he says, the *āśvins* are the physicians of the gods

चन्दने विषधरान् सहामहे वस्तु सुन्दरमगुप्तिमत् कुत । रक्षितु वद किमात्मसौष्ठव सञ्चिता खदिर
कण्टकास्त्वया॥¹⁸⁵

The sandalwood tree which is so beautiful doesn't have around it thorns to protect itself, but why you *khadira*, have so many thorns around you even when you don't look so beautiful

This tree is said to be the strongest tree within the limits of the trees as mentioned in the *vedas*

¹⁸⁴ T S 2 3 11

¹⁸⁵ S R B 165 1

Acacia catechu willd (AC) (Family Fabaceae and subfamily Mimosoideae)

known as black cutch has a diverse pharmacological actions and has been widely used in *āyurveda* for processing of various formulations in *rasaśāstra*. The main chemical constituents of Acacia Catechu are catechin, epecatechin, epigallocatechin, epicatechin gallate, phloroglucin, protocatechuic acid, quercetin, poriferasterol glucosides, lupenone, procyanidin, kaempferol, L-arabinose, D-galactose D-rhamnose and aldobiuronic acid, afzelchin gum, mineral and taxifolin. Heartwood is used to yield concentrated aqueous extract i.e. Cutch and *katha*. The cutch and *katha* (extract) possess astringent, cooling and digestive properties, and is commonly used in *āyurvedic* preparations. It is useful in cold and cough, ulcers, boils and eruptions of the skin, bleeding piles, uterine haemorrhages, atonic dyspepsia, chronic bronchitis etc.

The botanical name of *khadira* is *Acacia catechu*. The *samskr̥tam* word *khadira* literally means that which alleviates the diseases and stabilizes the body. Also known as *vakrakanta* has hooked spines, *dantadhāvana* useful for cleansing the teeth, *kanthu* beneficial for the throat, *kusthānga* anti dermatosis, etc. The great sage *caraka*

has categorized it as *udarka prasamana* anti urticarial and *kusthānga* anti dermatosis.

ācharya vagbhata has highly praised it as the drug of choice for the treatment of numerous skin diseases. *Suśruta* has described the plant to be effective as an anti obesity herb. *Acacia catechu* Willd (Family Fabaceae and subfamily Mimosoideae) is widely used in *āyurveda* for many diseases and mainly for skin diseases. Most of the people in Kerala use boiled *khadira* water (*karingali* water) for drinking purpose. There are a number of *āyurvedic* *taila* (oil) formulations which contain *khadira* as one of the active ingredients. *Acacia catechu* is highly valuable for its powerful astringent and antioxidant activities. It is commonly known as *katha*.

which is an indispensable ingredient of Pan that is betel leaf preparation chewed in India. It is useful in dental, oral, throat infections and as an astringent for reducing oozing from chronic ulcers and wounds. The concentrated aqueous extract known as *khadr* gum or cutch is an astringent, cooling and digestive, beneficial in cough and diarrhea. Applied externally to ulcer, boils and skin eruptions and is used extensively in *āyurvedic* formulations. It is used in the treatment of passive diarrhea either alone or in combination with cinnamon or opium. The bark of *Acacia catechu* in combination with other drugs is prescribed for snake bite. The seeds of the plant are reported to possess hypoglycemic activity in rats. *Acacia catechu* also shows hypotensive effect. The decoction of bark mixed with milk is taken to cure cold and cough. The extracts of *Acacia catechu* exhibit various pharmacological effects like antipyretic, anti-inflammatory, antidiarrhoeal, hypoglycemic, hepatoprotective, antioxidant and antimicrobial activities. Main chemical constituents of *Acacia catechu* Willd are catechin, epicatechin, epigallocatechin, epicatechin gallate, epigallocatechin gallate, rocatechin, phloroglucin, protocathechuic acid, quercetin, poriferasterol glucosides, poriferasterol acylglucosides, lupenone, lupeol, procyanidin AC, kaempferol, dihydrokaempferol, taxifolin, (+)- afzelchin gum and mineral. The chief phytoconstituent of the heartwood are catechin and epicatechin. Catechins have significant antioxidant and antimicrobial effects. It is considered to be the best antioxidant. The antioxidant activities are evaluated in terms of ascorbate equivalents by different methods. The extract restores antioxidant enzyme superoxide (SOD) from the radiation inducing damage. *Acacia catechu* is useful as a topical agent for sore gums and mouth ulcers. This agent has been commonly used in India as an ointment for indolent ulcers and has been used in rural Bangladesh as a component of an anti-fertility pill. Other uses include arresting nose bleeds, assisting healing in nipple fissures, and acting as a contraceptive. Chronic gonorrhea can be treated with an infusion of catechu. As a fuel, the tree is often planted for use as firewood and its wood is highly valued for

furniture and tools also Timber Timber is used for agricultural implements and wheels Tannin or dyestuff Cutch, which is marketed as a solid extract, is isolated from the heartwood The dark catechu or Pegu cutch is used to tan heavy hides into sole leather, often in a mixture of tan stuffs Catechu extract is also used for dyeing silk, cotton, canvas, paper and leather to a dark-brownish colour

- करीर - **Capparis decidua**

amara - marubhūmijah usnapriyah kantakāṁ ksah krakara granthla krakaca

bhāvaprakāśa - nispati ikā karirā gūdhapatra karaka tīksnakantaka

मधुषा सयौत्यपा वा एष औषधीना रसो यन्मधु अद्वा एवौषधीभ्यो वृष्टि निनयति।¹⁸⁶

The *vedic* idea revolving around this tree is unique If this tree's twigs are given as sacrificial sticks, these sticks in the combination of other ingredients of the sacrifice and the *mantras* will fetch rain and hence the *vedic* terminology says for rain one has to perform *kārīristiyajñā*

When an anthill is found to the north of this tree sweet water is indicated to the south of the tree at the depth of ten-man heights If it is in the combination of *bilwa* it also indicates a sweet water zone¹⁸⁷

According to the *unani* system of medicine the plant has been used as a carminative, tonic, emmenagogue, aphrodisiac, alexipharmic, improves the appetite, good for rheumatism, lumbago, hiccough, cough and asthma

The top shoots and young leaves are made into a powder and used as a blister, they are also used in boils, eruptions and swellings and as an antidote to poison They are very efficacious in relieving toothache when chewed, a decoction of ground stems and leaves is used for pyorrhoea The fruits are astringent, are useful in cardiac troubles The young flower bud and fruits are pickled Fruits are eaten either green or ripe Useful in facial paralysis and solves problems of enlarged spleen, kills intestinal worms It is given in phthisis, heart diseases and scurvy In

¹⁸⁶ TS 249

¹⁸⁷ बल्मीक सौम्य पश्चिमस्था, कर्कन्धुश्चेत् पुभिः ११ १८ २ & ६

Rajputana, the plant is a wholesome fodder for camels. Juice of fresh plant is dropped into the ear to kill worms. Root powder is taken with water in liver problems. The root bark extract is given twice a day for 3 days in the treatment of haemorrhoids. The plant is used for its medicinal value in diabetes, rheumatism, hypertension and various stomach problems. Wood being very strong and durable is used to make the foundations around the wells and as fire wood. Flower buds are eaten to relieve stomach ache, root paste is applied on scorpion bite, powdered coal from stem is taken during fractured bone. The stem bark decoction (10-15ml) is administered twice a day in asthma and other respiratory disorders. The fruit extract produced significant hypocholesterolemic effect which appeared to be due to increase faecal excretion of cholesterol and bile acids which is attributed to its hemi cellulose content. The extract of defatted fruit inhibited the development of atheroma and prevented the accumulation of cholesterol and triglyceride in liver and aorta of rabbits. Powdered fruit reduced Alloxan induced lipid peroxidation and subsequently altered super oxide dismutase and catalase in erythrocytes, kidney and heart. It reduced oxidative stress in diabetes. The extract of the fruit produced antibacterial and antifungal activities. The extract of fruit pulp, seeds, and alkaloid isolated from the extract demonstrated anthelmintic activity and affected bowel movement. Activity of the seed volatiles against *Vibrio cholera* has been recorded. Aqueous extract of the plant exhibits anthelmintic activity, seeds contain antibacterial principles-glucocapparin, isothiocyanate aglycone of glucocapparin. The bark part has anthelmintic, constipative and purgative.

According to the well known versatile medicinal properties and pharmacological actions of *Capparis decidua*, the present article provides an updated account of different aspects of the phytochemical and pharmacological properties.

The content of biologically active compounds, as well as the potential antidiabetic activity of *Capparis decidua*, has been investigated in many studies.

One study states, the compositional studies indicated *Capparis decidua* seeds as rich sources of all three major food components, i.e. carbohydrates, lipids and proteins. Similarly, the amino acid profile indicated sufficient amounts of both essential and non-essential amino acids. Fatty acid analyses indicated that unsaturated fatty acids are present in abundance, while all major tocopherols are present in significant amounts. The tested extracts are rich in phenolic compounds, as well as in glucosinolates, which may contribute to its *in vivo* antidiabetic effect. Furthermore, the study suggests that the glucose lowering effect of this plant can be due, at least in part, to the inhibition of α -amylase. In conclusion, the results from this study contribute to the rational use of *C. decidua* in folk medicine for the treatment of diabetes, by inhibition of α -amylase activity. Further, the study says the further investigations are warranted to identify the active principles and elucidate other possible mechanism(s) of action.

When pickled or cooked as vegetables, the immature fruits are used to cure stomach problems, especially constipation. The bark is used to cure coughs, asthma, ulcers, boils, vomiting, piles and all types of inflammations. Stem bark, meanwhile, is used for rheumatism and toothaches, including pyorrhea. When crushed, the leaves are applied as a poultice on burns and inflammations. They are chewed to relieve toothaches, or consumed as healthy appetizers for those with cardiac problems. The young leaves and shoots, meanwhile, are dried and powdered and used as antidote against poison and as a cure for joint problems. The young shoots of *Peganum harmala* and *karīr* can be combined as an antifertility drug. The fruits and the seeds of *karīr* are used to cure cholera, dysentery, and urinary purulent discharges. The fruits' sharp and spicy taste serves as an astringent to bowels, remedies foul breath, and cures cardiac troubles. The oil from the seeds contains nitrogen and sulphur. This is used to cure skin diseases. The alcoholic extract of flowers, fruit husks and seeds show anti-bacterial potentials. *Karīr's* wood,

meanwhile, works better when applied for muscular injuries if the wood has been burnt first

- पीलु - *Salvadora persica*

त्वम् इन्द्र कपोताय छिन्नपक्षाय वञ्चते । श्यामाक पक्व पीलु च वारस्मा अकृणोर् बहु ॥¹⁸⁸

Thou, *indra*, to the trembling dove whose pinions had been rent and torn Gayest ripe grain and *pīlu* fruit, gavest him water when athirst The ready praiser loudly speaks though fastened triply with a strap

There is a very special mentioning of this plant in many texts saying it should be planted by the kings under their own supervision and if done so, it brings wealth, health and prosperity¹⁸⁹

This plant's food shouldn't be ordered to gods and *brāhmins*¹⁹⁰ (and the reason for this is unknown and not unintelligible)

An anthill to the east of a this tree indicates excessively salty water to the south at the depth of one to seven man-heights¹⁹¹

The combination with other trees indicates water at variety of distances and also the quality of water¹⁹²

The leaves are used in the treatment of nose trouble, piles, scabies, leucoderma, inflammation, scurvy, gonorrhea and pain The bark is useful in the treatment of low fever and amenorrhea The root is useful in the treatment of toothache and chest

¹⁸⁸ A V 20 135 12

¹⁸⁹ अधोभागे उत्तरायणमसिके^{KKS 121}

¹⁹⁰ देवाश्च सम्प्रकीर्तित, द्वितीयो रक्षणव्रती, तदर्हो द्रव्यमाद्यम् वारहरुपिणा^{KKS 3 7 & 9}

¹⁹¹ वाल्मिको गौरवर्णो हस्तप्रमाणम्^{V V 1B 3}

¹⁹² रोहीत स्यात् तदनुच मिष्टा, बिल्व स्यात् पुष्पि^{V V 1B 5 & 6}

disease *miswak* is a chewing stick prepared from the roots, twigs, or stems of *Salvadora persica*. *miswak* extract showed a high content of sodium chloride and potassium chloride as well as salvadourin and salvadorine, saponins, tannins, vitamin C, silica, and resin in addition to cyanogenic glycoside and benzylisothiocyanate

- प्लक्ष - **Ficus virens aiton**

The other names of this tree as per lexicons of many other Indian scriptures-

Amara - *jatī parkatī*

Śabdaratnakara - *parkatī plaksā plīksā jatī*

Bhāvaprakāśa - *parkatīh*

hemacandrah - *paksakah*

पशुना वै देवास्सुवर्गं लोकमायन्तेऽमन्यत मनुष्या नोऽन्वाभविष्यन्तीति तस्य शिरश्छित्त्वा मेध्यं प्राक्षारयन्स प्रक्षोऽभवत्तत्प्रक्षस्य प्रक्षत्वम्॥¹⁹³

The speckled butter is the expiration and the inspiration of cattle, when the beast is offered the body comes into the heart, in that he sprinkles the heart with speckled ghee, he thus places expiration and inspiration in the body of cattle. By means of the beast the gods went to the world of heaven. They reflected, 'Men will mount after us.' They cut off its head and made its sap stream forth, it became the *plaksa* (tree), that is the nature of the *plaksa*.

तस्य मेध्यं प्राक्षारयन् स प्लक्षोऽभवत्।¹⁹⁴

This statement of the *vedas* looks alike with the narration of the *yajurveda* in regard to the birth of the *plaksa*.

¹⁹³ T S 6 3 10

¹⁹⁴ M S 3 8 3 21

भद्रात् प्लक्षान्निस्तिष्ठस्यश्चत्थात् खदिरात् धवात्। भद्रान्यग्रेधात् पर्णात् सा न एह्यरुन्धति॥¹⁹⁵

Let all these plants come into our life as medicines

अथ यत्प्लाक्षाणि यशसो वा एष वनस्पतिरजायत यत्प्लक्ष द्वेधा
विगृह्णीयादभ्यन्यानि परिशिष्यात्॥¹⁹⁶

This tree is a symbol of success and triumph to a *ksatriya* and it is also believed to bring luck and goodness to him. By using this fruit he becomes effulgent and emancipated from perennial problems.

The uses of this tree is very less as it has less medicinal properties. This tree's leaves are like by the elephants and domesticated animals like cows and goats.

But interestingly there are a few texts which say that the tree's different parts are used for healing the mental diseases¹⁹⁷

- काश्मर्य – *Gmelina arborea*

The other names of this species being-

amarakośa- gambhārī vrksa

*bhāvaprakāśa - bhadraparnī śreeparnī madhuparnika kāśmarī kāśmīrī hīra
kāśmarya rohini krsnavrnta madhurasā and mahākusumikā*

The *vedic* references are in plenty-

प्राञ्जमुप दधाति दाधार यजमानलोकन्न पशूनाञ्च यजमानस्य च प्राणमपि दधात्यथो खल्विष्टकामा
आतृण्णमनूप दधाति प्राणानामुत्सृष्ट्यै द्रप्सश्चस्कन्देत्यभि मृडयति होत्रास्वेवैनम्प्रतिष्ठापयति

¹⁹⁵ A V 5 5 5

¹⁹⁶ A B 7 5 32

¹⁹⁷ कटुत्व कषायत्व शिशिरत्व रक्तदोषमूर्छाभ्रमप्रलापनाशित्वञ्च - राजनिघण्टु

सुचावुप दधात्याज्यस्य पूर्णाङ्कार्क्षर्मयमीन्द्रा पूर्णामौदुम्बरीमिय वै कार्क्षर्मयम्यसावौदुम्बरीमे
एवोपधत्ते ॥¹⁹⁸

तूष्णीमुपदधाति न हीमे यजुषाऽसुमर्हति दक्षिणाङ्कार्क्षर्मयमीमुत्तरामौदुम्बरीन्तस्मादस्या
असावुत्तराऽज्यस्य पूर्णाङ्कार्क्षर्मयमी वज्रो वा आज्य वज्र कार्क्षर्मयो वज्रेणव यज्ञस्य दक्षिणतो
रक्षागस्यप हन्ति दध्न पूर्णामौदुम्बरीम्पशवो वै दध्यूर्गुदुम्बर पशुष्वेवोर्जन्दधाति पूर्णे उप दधाति
पूर्णे एवैनम्¹⁹⁹

'The holy power born', (with these words) he puts down the gold disk *Prajāpati* created creatures with the *brahman* class as first, verily the sacrificer creates offspring with the *brahman* as first, 'the holy power born', he says, therefore the *brahman* is the first, the first he becomes who knows thus The theologians say, 'Nor on earth, nor in the atmosphere, nor on sky should the fire be piled', if he were to pile (it) on earth, he would afflict the earth with pain, nor trees, nor plants would be born, if he should pile (it) in the atmosphere, he would afflict the atmosphere with pain, the birds would not be born, if he should pile (it) in the sky, he would afflict the sky with pain, *parjanya* would not rain He puts down a gold disk, gold is immortality, verily in immortality he piles the fire, for propagation He puts down a golden man, to support the world of the sacrificer, if he were to put it over the perforation in the brick, he would obstruct the breath of cattle and of the sacrificer, he puts it down on the south side with head to the east he supports the world of the sacrificer, he does not obstruct the breath of cattle and the sacrificer Or rather he does place it over the perforation of the brick, to allow the breath to pass out 'The drop hath fallen', (with these words) he touches it, verily he establishes it in the

¹⁹⁸ T S 5 2 7 3

¹⁹⁹ T S 5 2 7 4

hotā's offices He puts down two ladles, one made of *kārśmarya* and full of butter, one of *udumbara* and full of curds that made of *kārśmarya* is this (earth), that of *udumbara* is yonder (sky), verily he deposits these two (earth and sky) In silence he puts (them) down, for he should not obtain them with a *yajus*, the *kārśmarya* on the south, the *udumbara* on the north, therefore is yonder (sky) higher than this (earth), the *kārśmarya* filled with butter, the butter is a thunderbolt, the *kārśmarya* is a thunderbolt, verily by the thunderbolt he smites away the demons from the south of the sacrifice, the *udumbara* filled with curds, curds are cattle, the *udumbara* is strength, verily he confers strength upon cattle He puts (them) down filled, verily filled they wait on him in yonder world

‘In the *virāj* should the fire be piled’, they say, the *virāj* is the ladle, in that he puts down two ladles, he piles *agnī* in the *virāj* As each beginning of the sacrifice is being performed, the demons seek to destroy the sacrifice, the golden disk is a beginning of the sacrifice, in that he pours butter over the gold disk, he smites away the demons from the beginning of the sacrifice With five (verses) he pours butter, the sacrifice is fivefold, verily he smites away the demons from the whole extent of the sacrifice, he pours butter transversely, therefore animals move their limbs transversely, for support

यत्र देवा अग्रे पशुमालेभिरे तदुदीच कृष्यमाणस्यावानेध स एष वनस्पतिरजायत॥²⁰⁰

Once while sages were chopping the brain off the sacrificial animal as a part of the sacrifice, the brain fell on the ground and this turned in the Gmelina Arboria

वज्र काश्मर्य ²⁰¹

In the last *mandala* of *rgveda* we see, a metaphor which compares this tree to diamond and it symbolically speaks the strength and vigour of the tree.

²⁰⁰ S B 12 9 1 5

²⁰¹ R V 10 100 10

देवा वै या आहुतीरजुहुवुस्ता असुरा निष्कावमादन्ते देवा काश्मर्यमपञ्चन्कर्मण्यो वै कर्मैनेन कुर्वितेति ते काश्मर्यमान् परिधीनकुर्वत तैर्वैस रक्षास्यपाघ्नत यत् काश्मर्यमया परिधयो भवन्ति रक्षसामपहृत्यै॥²⁰²

Another story from the *taittirīya āraṇyaka* says that once in a war between the gods and demons, the demons tried to steal away the *samidhs* reserved for the gods and this tree's *samidhs* brought about death of the demons and thereby protected the *samidhs* from being stole away and thereby also became the most loveable tree of the gods

ते वै पालाशा स्यु । ब्रह्म वै पलाशो ब्रह्माऽग्निरग्रयो हि तस्मात्पालाशा स्यु ॥ यदि पालाशान्न विन्देत् । अथोऽपि वैककता स्यु यदि वैककतान्न विन्देदथोऽपि काश्मर्यमया स्यु यदि काश्मर्यमयान्न विन्देदथोऽपि वैल्वा स्यु अथो खादिरा अथो औदुम्बरा एते हि वृक्षा यज्ञियास्तस्मादेतेषा वृक्षाणा भवन्ति॥²⁰³

The enclosing sticks should be of this very tree as this tree's twigs are considered as *brahman* and as *agni* is also *brahman* this should be alone in every *yajña*

Gamhar timber is reasonably strong for its weight It is used in constructions, furniture, carriages, sports, musical instruments and artificial limbs Once seasoned, it is a very steady timber and moderately resistant to decay and ranges from very resistant to moderately resistant to termites The bark of *Gmelina arborea* are stomachic, galactagogue, laxative and anthelmintic, improve appetite, useful in hallucination, piles, abdominal pains, burning sensations, fever, *tridośa* and urinary discharge It is also recommended with other drugs for the treatment of snake-bite and scorpion-sting Leaf paste is applied to relieve headache and juice is used as wash for ulcers Gamhar leaves, *apāmarga* roots and bark skin of *śamali* are

²⁰² T A 4 4

²⁰³ S B 1 3 3 19 & 20

mashed with cow's milk and are given orally to treat hyperacidity. The leaves juice, milk and sugar are recommended in inflammatory condition of urinary bladder and dysuria. Flowers are sweet, cooling, bitter, acid and astringent which is useful in leprosy and blood diseases. Fruit is acrid, sour, bitter, sweet, cooling, diuretic, tonic, aphrodisiac, promote growth of hairs, useful in *vāta*, thirst, anaemia, leprosy, ulcers and vaginal discharge. It is also recommended in raktapitta, excessive thirst, sexual debility in males and habitual abortion. The ripened fruit is valuable in heart disease of *vāta* imbalance. The cold infusion of tea prepared from gamhar fruits is extremely beneficial, mixed with honey and sugar in fever of *pitta* origin. The roots are described in the ayurvedic texts as mild laxatives which treats flatulence and increase appetite, lactation and reliever of menstrual irregularities. The cold infusion of candana, ustra and gamhar works well with sugar to alleviate the thirst. It is also useful in piles, burning sensation, fever and *tridośa*.

- खर्जूर – **Phoenix dactylifera**

जुहोति चतस्रो वै दिशश्चतस्रोऽवान्तरदिशा दिग्भ्य एव वृष्टिं स प्रच्यावति कृष्णाजिने स यौति हविरेवाकरन्तर्वेदि स यौत्यवरुध्यै यतीनामद्यमानानां शीर्षाणि परापतन् ते खर्जूरा अभवन् तेषां रस ऊर्ध्वोपतत्तानि करीराण्यभवन्स्रञ्ज्यानि वै करीराणि स्रञ्ज्या खलु वा आहुतिर्दिवो वृष्टिं च्यावति यत् करीराणि भवन्ति ।²⁰⁴

This is a story regarding the birth of this fruit. “He (Indra) makes, the quarters are four, the intermediate quarters are four, verily from the quarters he makes the rain to move. He unites (them) on a black antelope skin, verily he makes the offering, he unites within the *vedī*, for accomplishment. When the *yatis* were being eaten, their heads fell away, they became *kharjuras*, their sap rose upwards, they became *karīras*, the *karīras* are connected with *soma*, the offering connected

²⁰⁴ T S 2 4 9 2

with *soma* makes rain to move from the sky, in that there are *karīras* (in the sacrifice)”

Here are below a few explanations regarding the tastes of the fruit

अपक्वखर्जूरफल त्रिदोषशमन मतम्। पक्वमेव हित श्रेष्ठ त्रिदोषशमन मत परम्॥²⁰⁵

क्षयेऽभिघाते दाहे च वातपित्ते च तद्धितम्॥²⁰⁶

खर्जूरश्च विष हन्ति सदावै नात्र सशय ।²⁰⁷

अस्य मस्तिष्कगुणा । सादुत्वम्। तिक्तत्वम्। कषायत्वम्। मूत्रातङ्करोगनाशित्वम्।²⁰⁸

मधुरत्वम्। शीतलत्वम्। गुरुत्वम्। क्षयाभिघातदाहवातपित्तरोगे हितत्वम्। बृहणत्वम्। शुक्रवृद्धिकारित्वम्।²⁰⁹

मारुतमसि मरुतामोजोऽपा धारा²¹⁰

The uses of *Phoenix dactylifera*, also referred to as the date palm, has had a variety of purported medicinal uses throughout history. Some of the most common include the treatment of respiratory illnesses, gastrointestinal disturbances, and the improvement of fertility in both males and females. It is widely believed that *Phoenix dactylifera* possesses natural anti-inflammatory properties and may be used to treat conditions such as lupus or arthritis. Negative side effects related to the date palm are relatively rare, although some people may experience an allergic reaction to the fruit. Any specific questions or concerns about the use of the date palm in an individual situation should be discussed with a doctor or other medical

²⁰⁵ T H 1 27

²⁰⁶ C S 27

²⁰⁷ bhaisajya dhanvantari

²⁰⁸ rājavalabha

²⁰⁹ rājavalabha

²¹⁰ T S 2 4 7

professional Respiratory illnesses have been traditionally treated with *Phoenix dactylifera*. Asthma, bronchitis and tuberculosis are specific illnesses that may be treated with this herb. The date palm can be used as an expectorant to make coughs more productive and may also help to soothe a sore throat and reduce fever. A variety of gastrointestinal disturbances may be successfully treated using *Phoenix dactylifera*. In some cases, the date palm may be used as a laxative or taken to induce vomiting. Regular use of this herb may also help to treat inflammatory bowel disease. Caution should be used so that dehydration does not occur. If urine output decreases or sweating no longer occurs, a doctor should be consulted for further evaluation. Those who have been diagnosed with inflammatory conditions such as rheumatoid arthritis or lupus may benefit from the anti-inflammatory properties of *Phoenix dactylifera*. The fruit from the date palm tree is thought to cleanse and detoxify the liver and may protect the cells of the body from premature death. Some studies have indicated that the fruit from this tree may help to prevent certain forms of cancer. Throughout history, *Phoenix dactylifera* has been used as an aphrodisiac and to increase fertility. This fruit is believed to have mild estrogen-like effects, increasing the chances of fertility in women. Males may develop an increased sperm count as well as improved motility when using this herbal supplement. Most people are able to use *Phoenix dactylifera* without experiencing negative side effects, although allergic reactions are possible.

- गुग्गुलु - **Commiphora Wightii**

The other names of this species-

Śabdacandrikā - *raktasobhāñjanavrkṣa*

Amarakośa – *kumbha, ulūlu, kauśika* and *pura*

Ratnamālā - *jatāyu, kālanīryāsa, devadhūpa, sarvasaha, mahisāksa, phalankasa, yavanadvista, bhavābhīsta, mīśātaka, jatāla, puta, bhūtahara, śiva, śāmbhava, durga, yātughna, mahisāksaka, devesa, matudista, raksohā* and *rūksagandhakahdivya*

Bharata –*kumbholu, khalaka, kambholūkhala* and *guggulu*

अग्नेस्त्रयो ज्यायासो भ्रातर आसन्।²¹¹

The species originated from *agni* 's sibling's muscle, so says the *taittirīya samhitā*

मास मासेन वर्धते।²¹²

This helps in the growth of strong muscles as this originates from the muscles

न त यक्ष्मा अरुन्धते नैन शपथो अश्रुते। य भेषजस्य गुग्गुलो सुरभिर्गन्धो अश्रुते॥²¹³

Never Consumption, never curse touches the man, *arundhatī*! Whom the delicious odour of the healing Bdelium penetrates, consumptions flee apart from it as from a wild beast fly the deer If thou, O Bdelium, art produced from *sindhu* or hast come from sea, the quality of both have I taken to keep this man unscathed

Guggulu has been a key component in ancient Indian system of medicine But has become so scarce because of its overuse in its two habitats in India where its found -Gujarat and Rajasthan that the World Conservation Union (IUCN) has enlisted it in its Red Data List of endangered species *Guggulu* produces a resinous sap known as gum guggul The extract of this gum, called guggulipid, guggulipid or guggulipid, has been used in ancient Indian medicine, a traditional Hindu medicine, for nearly 3,000 years in India The active ingredient in the extract is the steroid guggulsterone, which acts as an antagonist of the farnesoid X receptor, once

²¹¹ T S 6 2 8

²¹² Unknown reference

²¹³ A V 19 38 1

believed to result in decreased cholesterol synthesis in the liver. However, several studies have been published that indicate no overall reduction in total cholesterol occurs using various dosages of guggulsterone, and levels of low-density lipoprotein ("bad cholesterol") increased in many people.

- कलिवृक्ष – **Terminalia Belerica**

The other names of this species –

Ratnamālā – *vibhītaka*, *kalidrūma*, *kalpavṛkṣa*, *samvartaka*, *kalivṛkṣa*, *viśaghna*, *anilaghna* and *kāsaghna*

नीचावर्तन्त उपरि स्फुरन्त्य हस्तातो हस्तवन्त सहन्ते। दिव्या अङ्गारा इरिणे न्युप्ता शीता सन्तो हृदय निर्दहन्ति॥²¹⁴

Downward they roll, and then spring quickly upward, and, handless, force the man with hands to serve them. Cast on the board, like lumps of magic charcoal, though cold themselves they burn the heart to ashes.

अक्षास इदं कुशिनो नितोदिनो निकृत्वा नस्तपनास्तापयिष्णव । कुमारदेष्णा जवत पुनर्हृणो मध्वा सम्पृक्ता कितवस्य बर्हणा॥²¹⁵

Dice, verily, are armed with goads and driving-hooks, deceiving and tormenting, causing grievous woe. They give frail gifts and then destroy the man who wins, thickly anointed with the player's fairest good.

In ancient Indian medicine the drug is classified under the category of expectorant. It is an integral part of ancient Indian medicine's laxative formulation, *triphala* used in treatment of common cold, pharyngitis and constipation. The bark is mildly diuretic and is useful in anaemia and leucoderma. The Fruits are astringent,

²¹⁴ R V 10 34 9

²¹⁵ R V 10 34 7

acid, digestive, anthelmintic, aperient, expectorant, sweet, anodyne, stypic, narcotic, ophthalmic, antipyretic, antiemetic and rejuvenating Unripe fruit is a mild laxative and ripe fruit is an astringent Seeds are used as aphrodisiac Oil extract from the seed pulp is used in leucoderma and alopecia Modern investigations have proved the laxative activity of the oil

- प्रियङ्गुः - *Aglaia elaeagnoides*

यन्मसूयैर्जुहोति। सर्वा व तदेवता प्रीणाति। प्रियगुतण्डुलैरुहोति। प्रियागा ह वै नामैते। एतैर्वै देवा अश्वस्यागानि समदधु। यत्प्रियगुतण्डुलैर्जुहोति। अश्वस्यिवागानि।²¹⁶
पयसो मरुतो जाता पृश्नियै प्रियङ्गवो मारुता खलु वै।²¹⁷

Verily with power (*indriyēna*) he surrounds his fellows on both sides The sacrificial fee is a garment with a fringe, for the delectation of his fellows He who desires a village should offer to the *maruts* an oblation of panic seed in the milk of a speckled (cow), from the milk of a speckled (cow) were the *maruts* born, of the speckled (cow) panic seed, his fellows have the *maruts* for their deity, verily he has recourse to the Maruts with their own share, verily they subject his fellows to him, he becomes possessed of a village The *yājya* and the *anuvākya* contain the word 'dear'

Medicinal uses of this plant is, it is cooling and astringent and employed in inflammations and febrile complaints The seeds are said to be useful in painful micturition The fruit is acidic in taste and edible

- देवदारु – *Cedrus deodara*

The other names of this species *pūtadāru*, *pitudāru* and *putudru*

अग्रेऽशरीरमसि पारयिष्णु रक्षोहाऽसि सपत्नहा। अथो असीव चातन पूतदुर्नाम भेषजम्॥²¹⁸

²¹⁶ T B 3 8 14 6

²¹⁷ T S 2 2 11 4

Body of *agru* prompt to save, slayer of fiends and foes art thou, yea, banisher of malady, the healing balm called *pūudru*

शरीर हे तवास्य पीतदारुतद्यत्वेनतु दारवा परिधयो भवन्ति शरीरेणैवेनमे तत्समर्द्धमति कृत्स्न करोति॥²¹⁹

तन्वोत्सृष्टनिवासेषु कङ्करज्जुक्षतत्वच । गजवर्ष्मकिरातेभ्य शशसुर्देवदारव ॥ त चे वायौ सरति सरस्कन्धसङ्घट्टजन्मा बाधेतोल्काक्षपितचमरीबालबारोदवाग्नि ॥²²⁰

The strength of *devadāru* is exhibited in one of the verses of *raghuvamśa's kālidāsa*, wherein it is said that the elephants along with their iron shackles were tied to the devadāru tree and whenever the elephants moved around, the tree used to show up a natural dent as a few outer layer of it would have been chipped by the forceful movement of the elephant. This used to be a mark for the hunters to know if there were king's troop walking around in the forest and if it was so, they had to refrain themselves from entering into it.

The heartwood is carminative, diaphoretic, diuretic and expectorant. A decoction of the wood is used in the treatment of fevers, flatulence, pulmonary and urinary disorders, rheumatism, piles, kidney stones, insomnia, diabetes etc. It has been used as an antidote to snake bites. The plant yields a medicinal essential oil by distillation of the wood, it is used in the treatment of phthisis, bronchitis, blennorrhagia and skin eruptions. A resin obtained from the wood is used externally to treat bruises, skin diseases and injuries to joints. The bark is astringent. It has proved useful in the treatment of fevers, diarrhoea and dysentery. In Ayurvedic medicine the leaves are used in the treatment of tuberculosis. An oil obtained from the seed is diaphoretic. It is applied externally to treat skin diseases.

²¹⁸ A V 8 2 28

²¹⁹ S B 3 5 2 15

²²⁰ R V 4 76

- विकन्तक – **Flacourtia Indica**

The other name of this species being *vikantaka*

The *vedic* references-

अयोमुखा सूचीमुखा अथो विकङ्कतीमुखा । क्रव्यादो वातरहस आ सजन्त्वं अमित्रान् वज्रेण
त्रिषन्धिना ॥²²¹

Let those with iron faces, with faces like needles or like combs, flesh-eaters,
rapid as the wind, cling closely to our foemen with *tri sandhu* for their thunderbolt

प्रजापतिर्वा अजुहोत्सा यत्राहुति प्रत्यतिष्ठत्ततो विकङ्कत उदतिष्ठत्तत प्रजा असृजत् ॥²²²

Prajāpati sacrificed, where the oblation found support, thence sprung the
vikantaka, there he created offspring, the oblation of him whose *dhruva*, is made of
vikantaka, wood finds rest, verily he is propagated That is the form of the offering-
spoons, on him whose spoons are so formed all forms of cattle attend, nothing
unshapely is born in him

वैकङ्कतीमादधाति भा एवावरुन्धे।²²³

He puts on (a stick) of *vikantaka* wood, verily he wins radiance, he puts on
one of *çamī*, for atonement ‘Do thou sit down in the lap of this mother’, with three
(verses) he adores (the fire) when born, three are these worlds, verily he attains
reputation in these worlds, verily also he bestows breaths on himself

अग्रेसृष्टस्य यत भा एवावरुन्धे।²²⁴

²²¹ A V 11 10 3

²²² T S 3 5 7

²²³ T S 5 1 19

नह्नतौन्यमृष्ट। ततो विकङ्कत समभवत्तस्मादेष यज्ञियो यज्ञपात्रियो वृक्षस्तत एते देवाना
वीराऽजायन्ताग्रियो य पवते सूर्य स यो हैवमेतान् देवाना वीरान्नवेदाऽहाऽस्य वीरो जायते॥ 225

This tree is supposedly to be the very important one in the preparation of all kinds of sacrificial utensils. The utensils of each tree has its own significance and the fruition as the end result when considered each utensil made out of different tree gives different fruits. Though it is almost impossible to cite any concrete reason as to why it is so, yet for someone who has a total belief in *vedic* scriptures has to resort to belief and surrender to the meanings as they are.

विकङ्कतफल पक्व मधुर सर्वदोषजित्।²²⁶

The roots are sweet, refrigerant, depurative, alexipharmic and diuretic. They are useful in vitiated conditions of *pitṭa* and *vāta* aphthae, poisonous bites, skin diseases, pruritus, erysipelas, strangury, nephropathy and psychopathy. The leaves are useful in pruritus and scabies. The fruits are sweet, appetizer, digestive and diuretic, and are useful in strangury jaundice, gastropathy and splenomegaly (Indian medicinal plants).

- **वरण – Crateva Magna**

The other names of this species being-

Śvetapuspaka, tiktaśākah, kumārah, śvetadrumah, gandhavrksah, tamālah, mārutapah and *aśmarighnah*

अथ वारनसुवेण वारण्या सुचि चतुर्गृहीतमाज्य गृहीत्वा जुहोति।²²⁷

²²⁴ T A 5 4

²²⁵ S B 2 2 4 10

²²⁶ B P 623

²²⁷ T A 6 10

This tree's timber is used in preparations of the sacrificial implements, especially to give *havis* to the lord of death

वारण पश्चादघ मे वारयता इति वृत्रशङ्कून् दक्षिणतो।²²⁸

This tree's enclosed stick should be stabilized in the earth near the grave yard while performing *piti medhayajña*

It is used mainly in the treatment of urinal calculi, crystalluria and urinary infections, but is valued as a bitter, antiperiodic, aperitif, astringent, demulcent, laxative, rubefacient, tonic, liver stimulant and vesicant. It has been used for malaria and tumours. The stem bark is used in the treatment of renal lithiasis, swelling of the liver and diarrhea. This was used for blood purification and as also as to bring about homeostatis

- वेणु – **Bambusa Bambos**

त् तु देशमतिक्रम्य शैलोदा नाम निम्नगा। उभयोस्तीरयोस्तस्या कीचका नाम वेणव ।²²⁹

वीर्यसम्मितो वेणुना वि मिमीत आग्नेयो वै वेणुस्सयोनोत्वाय यजुषा युनक्ति

न बहव सम् अशकन् नार्भका अभि दाधृषु । वेणोर् अद्वा इवाभितो 'समृद्धा अघायव ॥²³⁰

Not many have had power enough, the feeble ones have not prevailed, like scattered fragments of a reed never are the wicked prosperous

वेणव कीचकास्ते स्युर्ये स्वनन्त्यनिलोद्धता ।²³¹

²²⁸ S B 13 8 4 1

²²⁹ sabdaratnāvalī

²³⁰ A V 1 27 3

²³¹ A Sanskrit proverb- Unknown reference

One variety of bamboo is known to be *kīcaka*, if it makes pleasant sound when there is a breeze

The medicinal uses of this species- fresh juice of the leaves of *Bambusa bambos* was tested for uterine activity on isolated human as well as rat uterus and it was found to have a weak ecbolic action (an agent produces rapid labour) in a dose 1 to 10 mg/ml. Extract of its leaves show antitumor activity in rat. Extract of its leaves show antitumor activity in rat. Extract of its leaves show antitumor activity in rat. Hot water extract and alcoholic extract of the leaves of this plant was used as deodorant. An ethanolic extract of *Bambusa bambos* tender shoot caused a reduction in fertility of male rat. The dealcoholized extract of leaves has shown antibacterial activity against *Bacillus subtilis*, *Micrococcus pyogens*, *Staphylococcus aureus* and *Salmonella typhi* at a concentration of 0.1-0.35% (at pH 7 and pH 5.5). Hot water extract and alcoholic extract of leaves used as deodorant. The dealcoholised extract of leaves has shown antibacterial activity. Leaves of *Bambusa bambos* contain digestible crude amino acid, mainly methionine and lysine. Literature review reveals that studies on food safety aspect of bamboo shoot are unsystematic and scanty, hence need special attention. Similarly indepth investigation on effect of processing (boiling, fermenting, canning etc) on total nutrient content (macro and micro) of various bamboo shoot species growing in different agroecological regions needs to be carried out. It would help in converting the non-edible species into edible one, thus enhancing the business scope for rural people. Scientific validation of indigenous knowledge of tribal coupled with modern scientific inputs would provide guidelines for evolving a simple, efficient system for bamboo shoot utilization. Thus, several important knowledge gaps identified in this paper would give impetus to new academic and R&D activities, in turn generating innovative job profile in food industries as well as rural entrepreneurship.

- **जम्बू – Syzygium Jambos**

यदि दृष्टा त्वया सीता जम्बु जाम्बूनदसमप्रभा। प्रिया यदि विजानीषे निश्शङ्क कथयस्व मे॥²³²

जम्बूप्रियालपनसप्लक्षन्यग्रोधतिन्दुका । अश्वत्थ कर्णिकारश्च चूताश्चान्ये च पादपा ॥²³³

ततो वेतसशाखाश्च जम्बूशाखाश्च वीर्यवान्। चकार लक्षणश्छित्वा सीताया सुखमासनम्॥²³⁴

शिशुपामलकीजम्बो याश्चान्या काननेषुता । मालतीमल्लिकाजातिर्याश्चान्या कानने लता ॥ प्रमुदा विग्रह कृत्वा भरद्वाजाश्चमोऽवदन्॥²³⁵

अन्ये जम्बूवादयो वृक्षा नृपोद्याने जलाशये। आरोप्य विधिवद्धीमान् अनन्तफलमश्नुते॥

अज्ञानाज्ज्ञानतो वापि जम्बूर्येन प्ररोपिता। गृहेऽपि स वसन्नित्यमपि धर्मेण युज्यते॥

Infectious diseases account for high proportion of health problems in the developing countries like India. Microorganism has developed resistance to many antibiotics and this has created immense clinical problem in the treatment of infectious diseases. The resistance of the organism increased due to the indiscriminate use of commercial antimicrobial drugs commonly used for the treatment of infectious diseases. This situation forced the scientist to search for new antimicrobial substances from various sources including medicinal plants. Many of the plants used today were known to the people of ancient culture throughout the world for their preservative and medicinal powers. However several plants are used in India in the form of crude extracts, infusions or plaster to treat common infections without scientific evidence of efficacy. Natural products of plant origin have played significant role in the search of therapeutic drugs such as quinine from cinchona. Search for new antimicrobials is very important in recent time considering the

²³² Rāmāyana Ar K 60 19

²³³ Rāmāyana Ar K 73 3

²³⁴ Rāmāyana Ay K 55 15

²³⁵ Rāmāyana Ay K 91 51

escalating levels of antibiotic resistance among pathogenic bacteria. Many more herbal ingredients are present over the counter drugs such as laxatives. Medicines that come from plants include aspirin from willow bark. Tannin content present in some plants has the ability to act against the microorganisms such as *S. aureus*, *Salmonella species*, *E. coli*, *Pseudomonas species* and so on. Tannin is a general descriptive name for a group of polymeric phenolic substances capable of tanning leather, or precipitating gelatin from solution, a property known as astringency. According to Scalbert, tannin can be toxic to filamentous fungi, yeast and bacteria. Condensed tannins have been determined to bind cell walls of ruminal bacteria. *Syzygium jambos* (L) Alston (*Eugenia jambos*) is widespread in sub-Saharan Africa (Benin, Democratic Republic of Congo and Cameroon) where its bark is traditionally used to treat infectious diseases. It is also distributed in Reunion Island, Central America (Guatemala) and Asia (Malaysia, Nepal) where fruits are eaten. Besides studies on the fruit volatiles and sugars, the only part of the plant chemico-pharmacologically studied was the leaves. Aqueous, methanol, and ethyl acetate extracts of *S. jambos* leaves from Guatemala have been shown to possess anti-inflammatory activity in adjuvant carrageenan induced inflammation model in rats. *S. jambos* may be merely a shrub but is generally a tree reaching 7.5-12 m in height and has a dense crown of slender, wide spreading branches. In India, the fruit is regarded as a tonic for the brain and liver. An infusion of the fruit acts as a diuretic and sweetened preparation of the flowers is believed to reduce fever. The seeds are employed against diarrhea, dysentery and catarrh. In Nicaragua, it has been claimed that an infusion of roasted, powdered seeds is beneficial to diabetics.

- बिल्व – **Aegle Marmelos**

महान् वै भद्रो बिल्वो महान् भद्र उदुम्बर ॥²³⁶

The *bilva* tree is not just big, but it is equally auspicious and so is *udumbara*

²³⁶ A V 20 136 13

यस्तु सरोपयेद्विल्व शङ्करप्रीतिकारकम्। सत्कुलेऽपि सदा लक्ष्मी सन्तिष्ठेत्पुत्रपौत्रिके॥²³⁷

The one who plants the *bilva* tree will see his lineage live happily with prosperity always at their doorstep

अश्वत्थ बिल्ववृक्ष व वट धात्रीमशोकदम्। वटपञ्चकमित्युक्त स्यापयेत्पञ्चवृक्षक ॥²³⁸

The one who desires to see not hell shouldn't use the wood of the *bilwa* tree as fuel

The different parts of Bael are used for various therapeutic purposes, such as for treatment of asthma, anaemia, fractures, healing of wounds, swollen joints, high blood pressure, jaundice, diarrhoea healthy mind and brain Typhoid troubles during pregnancy Aegle marmelos has been used as a herbal medicine for the management of diabetes mellitus in Ayurvedic, Unani and Siddha systems of medicine in India, Bangladesh and Sri Lanka The main usage of the parts of this tree is for medicinal purposes The unripe dried fruit is astringent, digestive, stomachic and used to cure diarrhea and dysentery Sweet drink prepared from the pulp of fruits produce a soothing effect on the patients who have just recovered from bacillary dysentery The ripe fruit is a good and simple cure for dyspepsia The pulp of unripe fruit is soaked in gingelly oil for a week and this oil is smeared over the body before bathing This oil is said to be useful in removing the peculiar burning sensation in the soles The roots and the bark of the tree are used in the treatment of fever by making a decoction of them The leaves are made into a poultice and used in the treatment of opthalmia The leaf part of the plants have been claimed to be used for the treatment of inflammation, asthma, hypoglycemia, febrifuge, hepatitis and analgesic The mucilage of the seed is a cementing material The wood takes a fine polish and is used in building houses, constructing carts, agricultural implements A

²³⁷ V A 58

²³⁸ P N P 74

yellow dye is obtained from the rind of the unripe fruits. The dried fruits, after their pulp separated from the rind are used as pill boxes for keeping valuable medicines, sacred ashes and tobacco. In Homeopathic treatments it is largely used for conjunctivitis and styes, rhinitis, coccygodynia, nocturnal seminal emission with amorous dreams, chronic dysentery. Ayurveda prescribes the fruit of the herb for heart, stomach, intestinal tonic, chronic constipation and dysentery, some forms of indigestion, typhoid, debility, cholera, hemorrhoids, intermittent fever, hypocondria, melancholia and for heart palpitation. The unripe fruit is medicinally better than the ripe fruit. Leaf poultice is applied to inflammation, with black pepper for edema, constipation and jaundice.

- पलाश – **Butea Monosperma**

यस्मिन्वृक्षे सुपलाशे देवैः सम्पिबते यमः । अत्रा नो विश्रुतिः पिता पुराणा अनुवेनति॥²³⁹

In which tree yama along with other gods and goddesses drinks the soma juice in that tree we are allowed to meet our elders who are dead.

पलाशशाखिनहं सप्त रोपयेदेकमेव वा । ब्रह्मलोकमवाप्नोति पूज्यते सोऽमरैः सदा॥

If one can plant seven trees or even one tree for that matter he goes to the eternal world and he will be prostrated by the gods and goddesses.

The tree is considered by the Vedas to be as auspicious as the Brahman and as great as Brahman.

पलाशवटरम्भाद्या ज्ञेया पर्णोपयोगिनः ।²⁴⁰

Some trees like this are known for their optimum usage of the leaves.

²³⁹ R V 10 134 1

²⁴⁰ Unknown sources

In traditional medicine, there are many natural crude drugs that have the potential to treat many disease and disorders one of them is *Butea monosperma* (Lam) Taub (Syn *Butea frondosa*, Family Fabaceae) popularly known as 'dhak' or 'palas' ,commonly known as 'Flame of forest', palash , mutthuga ,bijasneha, khakara, chichara , Bastard teak , Bengal kino They comprise one of the largest families of flowering plants, numbering 630 genera and 18,000 species This is a moderate sized deciduous tree which is widely distributed throughout India, Burma and Ceylon extending in the north west himalayas as far as Jhelum except in very arid parts It is one of the most beautiful tree has been put to some useful purpose *Butea monosperma* is extensively used in Ayurveda, Unani and Homeopathic medicine and has become a cynosure of modern medicine The plants of this genus are well known for their colouring matters Commonly *Butea monosperma* is used as tonic, astringent, aphrodisiac and diuretics Roots are useful in filariasis, night blindness, helminthiasis, piles, ulcer and tumours It is reported to possess antifertility, aphrodisiac and analgesic activities Flowers are useful in diarrhoea, astringent, diuretic, depurative and tonic The stem bark is useful in indigenous medicine for the treatment of dyspepsia, diarrhoea, dysentery, ulcer, sore throat and snake bite Besides medicinal uses it is also having the economic use such as leaves are used for making platters, cups, bowls and beedi wrappers Bark fibres are used for making cordage Wood is used for well curbs and water scoop It is a cheap board wood Wood pulp is suitable for newsprint manufacturing *Butea* is also a host to the Lac insect, which produces natural lacquer *Butea superba* is a native herb in the family of Papilionaceae The Plant twinning woody long-life herbal plant exists only in Thailand This species can be found in the same habitat as *Pueraria Mirifica* in the mountainous area The long shape tuberos were annually enlarged and accumulated at least 15 chemicals in the group of direct chain organic acid especially flavonoids and flavonoid glycosides with c-AMP Phosphodiesterase potent inhibitor directly at the corpus cavernosum of the penis and resulted in

enhancing blood flow to that area. In addition, it supports normal sexual function, erectile capacity, enhance sensitivity and better performance. The preparation of *Butea superba* tubers has been used as an alternative herbal treatment for erectile dysfunction in males. The tubers of *Butea superba* have been found to contain estrogenic substances similar to follicle hormones. Roots of *Butea superba* show rejuvenating activity. The root barks of *Butea superba* shows 65% inhibitory activity on acetylcholinesterase. *Butea parviflora* also known as climbing *Butea* and *palashabheda*, is a large woody liane with large trifoliate leaves, white or cream coloured flowers and single seeded fruit found throughout in India. Roots contain rotenone.

- कर्कन्धु – *Zizyphus Mauritiana*

याभिरन्तक जसमानमारणे भुज्यु याभिरव्यथिभिर्जिजिन्वथु। याभि कर्कन्धु वय्य च .
जिन्वथस्ताभिरूषु ऊतिभिरश्विना गतम्॥²⁴¹

Wherewith ye rescued *antaka* when languishing deep in the pit and *bhujyu* with unfailing help. And comforted *karkandhu*, *vayya*, in their woe, - Come hither unto us, O *asvins*, with those aids.

इन्द्रस्य सुषुवाणस्य दशधेन्द्रिय वीर्यं परापतत्। यत् तृतीयम्।
तत्कर्कन्धु।²⁴²

When soma was crushed india's potential exploded in ten folds. He vomited the same thrice and what came out of him third time is karkandhu.

Zizyphus is one of which that is found in all over the world. Different types of morphological changes are found cause to temperature and climate changes. According to their morphological change, the species names were decided. *Zizyphus*

²⁴¹ R V 1 112 6

²⁴² T B 1 8 5

mauritiana Lam is one of which that is grown in dry places. It is generally used for feeding by cattle and camels and goats and get resistance power against different types of pathogens. Ziziphus mauritiana Lam belongs to the family of Ziziphus, belongs to the kingdom, plantae, order, rosales, division, magnoliophyta, class, magnoliopsida, family, rhamnaceae, genus, Ziziphus, species, mauritiana. Ziziphus mauritiana Lam is also called jujube tree. All the parts of this plant are very effective against the different types of diseases. Its leaves are useful in the treatment of diarrhea, wounds, abscesses, swelling and gonorrhea. The leaves mauritiana are also used in the treatment of liver diseases, asthma and fever. Carbohydrates, starch, proteins, sugar, mucilages and vitamins are abundantly found in ziziphus species. Ziziphus mauritiana Lam fruits can be used in the treatment of liver. Ziziphus mauritiana Lam fruiting time is February to March ending and the colour is red with more juicy as like litchi. The fruit has been used as anodyne, sedative, tonic anticancer, potent wound healer. It has also been used against asthma. The fruit Ndhala leaves and seeds extracts have been exhibit antioxidant activity whereas bark is reported to cytotoxicity against different cancer cell lines.

- **शमी – Acacia Ferruginea**

ईजे यज्ञेभिः शशमे शमीभिः ।²⁴³

He hath paid sacrifices, toiled in worship, and offered gifts to wealth-increasing *agni*, him the displeasure of the famous moves not, outrage and scorn affect not such a mortal.

स्तरीर्यत्सूत सद्यो अज्यमाना व्यथिरव्यथी कृणुत स्वगोपा। पुत्रो यत्पूर्वं पित्रोर्जनिष्टशम्या
गौर्जगार यद्ध पृच्छान्॥²⁴⁴

²⁴³ R V 6 3 2

²⁴⁴ R V 10 31 10

When suddenly called the cow that erst was barren, she, self-protected, ended all her troubles Earth, when the first son sprang from sire and mother, cast up the *śami*, that which men were seeking

शमीगर्भादिग्निं मन्थति।²⁴⁵

शमी शमयते पाप शमी शत्रुविनाशनम्। अर्जुनस्य धनुर्धारि रामस्य प्रियदर्शनम्॥ आदिराज, योगिराज, महाराज, वनराज, वनस्पते मिष्टान्नमिष्टदर्शनं कष्टदारिद्र्यनाशनम्॥²⁴⁶

The bark of *Acacia ferruginea* is bitter and traditionally used as hot anthelmintic, cure itching, leucoderma, astringent, ulcers, stomatitis, and diseases of the blood The extract of leaves is astringent, styptic, stops suppuration, enriches the blood, useful in liver complaints, disease of the eye, dysentery, gonorrhoea, gleet, burns and scalds, beneficial to the alimentary and urinary tracts The gum is demulcent, emollient, and nutrient The pods and the extract from them are astringent and demulcent A decoction of the bark of this plant, together with the *Tamarindus Indica* and a few other trees is frequently resorted to by the natives of this country, as a gargle in sore-mouth

- शाल्मली – **Bombax Ceiba**

यच्छल्मलौ भवति यन्नदीषु यदोषदीभ्यः परिजायते विषम्। विश्वेदेवा निरितस्तत्सुवन्तु मा पद्मेन रपसा विदत्सरु ॥²⁴⁷

The poison that is formed upon the *śalmalī*, that which is found in streams, that which the plants produce, all this may all the Gods banish and drive away let not the winding worm touch me and wound my foot

परशु चिद्वि तपति शिम्बल चिद्विवृश्चति। उखा चिदिन्द्र येषन्ती प्रयस्ता घेनमस्यति॥²⁴⁸

²⁴⁵ T B 1319

²⁴⁶ Unknown source

²⁴⁷ R V 7 50 3

He heats his very axe, and then cuts a mere Semal blossom off O *indra*,
like a caldron cracked and seething, so he pours out foam

Root is used in treating diarrhoea, dysentery, boils & burns, diabetes, impotence & as aphrodisiac, night pollution, scorpion sting & snakebite, sex tonic, urinary troubles, brain tonic, gonorrhoea, syphilis, bedwetting, leucorrhoea, & spermatorrhoea Whereas, stem & bark is used in bacterial, viral, protozoal infection & digestive disturbances, boil, heartburn, heart tonic, kidney stone, spermatorrhoea & weakness, headache, dislocated bones, easy delivery, snakebite, scorpion, centipede & spider stings Gum meanwhile are used to treat asthma, giardiasis, bleeding piles, diarrhoea & dysentery, dental caries, aphrodisiac & in scabies Leaves role is in treating glandular swellings, rheumatism, antidysenteric, haematinic, menorrhagia, leucorrhoea, anaemia & infertility Nevertheless, flowers are used in healing haematuria, anaemia, leucorrhoea, haemorrhoids, hydrocoele, gonorrhoea, menstrual disorders & leucorrhoea, boils & sores, splenomegaly, internal bleeding & cancer, colitis, premature ejaculation, snakebite, permanent sterilization, diuretic & laxative Fruits vitality is used as antifertility agent, uterus protrusion, leucorrhoea, Antidiabetis, antidiarrhoeal, snakebite Spines are further used for skin troubles, acne & headache Seeds thus being the all inclusive part of the tree assist in curing chicken pox & small pox

- **करञ्जः – Pongamia pinnata/ Pongamia glabra**

त्व करञ्जमुत पर्णय वधीस्तेजिष्ठयातिथिगवस्य वर्तनी । त्व शता वङ्गदस्याभिनत्पुरोजनानुद
परिषूता ऋजिश्चना²⁴⁹

²⁴⁸ R V 3 53 22

²⁴⁹ R V 1 53 8

Thou hast struck down in death *karañja*, *parṇaya*, in *atithigva*'s very glorious going forth Unyielding, when *rjīsvanā* compassed them with siege, thou hast destroyed the hundred forts of *vangrda*

अहं गुड्गुभ्यो अतिथिग्वमिष्करमिषं न वृत्रतुरं विक्षुं धारयम् । यत्पर्णयन् उत वा करञ्जहे प्राह महे
वृत्रहत्ये अशुश्रुवि²⁵⁰

Against the *gungus* I made *atithigva* strong, and kept him mid the folk like *vrtra*-conquering strength, when I won glory in the great foe-slaying fight, in battle where *karañja* fell, and *parṇaya*

Medicinal uses of roots- Juice of roots with coconut milk and lime water used for treatment of gonorrhea. Roots are also used for cleaning gums, teeth and ulcers. Roots are bitter anti-helminthic and used in vaginal and skin diseases. Juice of the root is used for cleansing foul ulcers and closing fistulous sores. Aqueous extracts of stem bark exhibit significant CNS sedative and antipyretic activity. Juice of leaves is used for cold, cough, diarrhea, dyspepsia, flatulence, gonorrhea, leprosy and leaves are antihelminthic, digestive and laxative used for inflammations, piles and wounds, as an infusion to relieve rheumatism and also as an extract to treat itches and herpes. Fruits used for abdominal tumors, useful in ailments of female genital tract, leprosy, tumour, piles, ulcers and upward moving of the wind in the abdomen, used for keloid tumors, used in hypertension, skin ailments and rheumatic arthritis. Seed powder valued as a febrifuge, tonic and in bronchitis and whooping cough, useful in inflammations, pectoral diseases, chronic fevers, hemorrhoids and anemia.

²⁵⁰ R V 10 48 8

- **अक्षः - Terminalia belerica**

न स स्वो दक्षो वरुण धृति सा सुरा मन्युर्विभीदको अचित्ति । अस्ति ज्यायान्कनीयस उपारे
स्वप्नश्चनेदनृतस्य प्रयोता॥²⁵¹

Not our own will betrayed us, but seduction, thoughtlessness, *varuna* wine,
dice, or anger The old is near to lead astray the younger even sleep removes not all
evil-doing

प्रावेपा मा बृहतो मादयन्ति प्रवातेजा इरिणे वर्वृताना । सोमस्येव मौजवतस्य भक्षो विभीदको
जागृविर्मह्यमच्छान् ॥²⁵²

Sprung from tall trees on windy heights, these rollers transport me as they
turn upon the table Dearer to me the die that never slumbers than the deep draught
of *maujavān's* own *soma*

यदादीध्ये न दविषाण्येभि परायद्भ्योऽव हीये सखिभ्य । न्युप्ताश्च बभ्रवो वाचमक्रतं एमीदेषा
निष्कृत जारिणीव ॥ ²⁵³

When I resolve to play with these no longer, my friends depart from me
and leave me lonely When the brown dice, thrown on the board, have rattled, like a
fond girl I seek the place of meeting

²⁵¹ R V 7 86 6

²⁵² R V 10 34 1

²⁵³ R V 10 34 5

मनो वाव वाचो भूयो यथा वै द्वे वामलके द्वे वा कोले द्वौ वाक्षौ मुष्टिरनुभवत्येव वाच च नाम च
मनोऽनुभवति स यदा मनसा मनस्यति मन्त्रानधीयीत्यथाधीते कर्माणि कुर्वीत्यथ कुरुते पुत्रांश्च
पशूँश्चेच्छेयेत्यथेच्छते इमं च लोकममुं चेच्छेयेत्यथेच्छते मनो ह्यात्मा मनो हि लोको मनो हि ब्रह्म
मन उपास्वेति ॥²⁵⁴

The mind is, verily, greater than speech Just as the closed fist holds two amalakas, or two plums, or two *aksa* fruits, so does the mind hold speech and a name For when a man thinks in his mind that he would read the sacred hymns, then he reads them When he thinks in his mind that he would perform actions, then he performs them When he thinks in his mind that he would have sons and cattle, then he desires them When he thinks in his mind that he would have this world and the other, then he desires them Mind, indeed, is the self, mind is the world, mind is *brahman* Meditate on the mind

In Ayurveda the drug is classified as an expectorant It is an integral part of Ayurvedic laxative formulation, Triphala used in treatment of common cold, pharyngitis and constipation The bark is mildly diuretic and is useful in anaemia and leucoderma The fruits are astringent, acrid, digestive, anthelmintic, aperient, expectorant, sweet, anodyne, stypic, narcotic, ophthalmic, antipyretic, antiemetic and rejuvenating Unripe fruit is a mild laxative and ripe fruit is an astringent Seeds are used as aphrodisiac Oil extract from the seed pulp is used in leucoderma and alopecia Modern investigations have proved the laxative activity of the oil

²⁵⁴ C U 731

- अजशृङ्गिः – *Gymnema sylvestre*

एयम् अगन् ओषधीना वीरुधाम् वीर्यावती । अजशृङ्ग्य् अराटकी तीक्ष्णशृङ्गी व्युषतु ॥²⁵⁵

Let *ajāsṛngī* penetrate, *arāṭakī* with sharpened horn

Although there are many phytoconstituents that could combat diabetes and obesity, a single phytoconstituent that could be used in the treatment of both the diseases simultaneously would be a welcome addition. Gymnemic acid fulfills this criterion. The common masses do not avail of the fact that obesity can also be caused due to over-accumulation of sugar molecules specially sucrose, along with fat molecules. The common man needs to be made aware of these facts, since they are posing a big threat after cardiac problems and cancer. This review paper aimed at putting forth a molecular perspective of the medicinal aspect of gymnemic acids, and also a possible linkage between obesity and diabetes via a potential common medicine.

- अपामार्ग – *Achyranthus aspera*/ *Terminalia oelerica*

क्षुधामार तृष्णामारम् अगोताम् अनपत्यताम् । अपामार्ग त्वया वय सर्वं तद् अप मृज्महे ॥²⁵⁶

Death caused by famine, caused by thirst, failure of children, loss of kine, with thee, O *apāmārga*, all this ill we cleanse and wipe away

अपामार्गो 'प' मारुक्षेत्रिय शपथश् च य । अपाह यातुधानीर् अप सर्वा अराय्य ॥²⁵⁷

²⁵⁵ A V 4 37 6

²⁵⁶ A V 4 17 6

²⁵⁷ A V 4 18 7

Let *apāmārga* sweep away chronic disease and every curse, Sweep
sorceresses clean away, and all malignant stingy hags

यद् अदो देवा असुरास् त्वयाग्रे निरकुर्वत । ततस् त्वम् अद्य ओषधे'पामार्गो अजायथा ॥²⁵⁸

As once when time began the Gods with thee expelled the *asuras*, even thence,
O Plant, wast thou produced as one who wipes and sweeps away

स एतानपामार्गानजनयत् । तानजुहोत् । तैर्वै स रक्षाग्स्यपाहतयदपामार्ग होमो भवति ।
रक्षसामपहत्यै ।²⁵⁹

Achyranthes aspera (Amaranthaceae) is an important medicinal herb found as a weed throughout India. Though almost all of its parts are used in traditional systems of medicines, seeds, roots and shoots are the most important parts which are used medicinally. Wide numbers of phytochemical constituents have been isolated from the plant which possesses activities like antiperiodic, diuretic, purgative, laxative, antiasthmatic, hepatoprotective, anti-allergic and various other important medicinal properties. The crushed plant is used in pneumonia and infusion of the root is used as mild astringent in bowel complaints. Decoction of powdered leaves with honey or sugar candy is useful in early stages of diarrhoea and dysentery.

From here on a lot of *mantras* culled from four different *vedas* are enlisted which has reference to different plant and tree species. The meaning of each *mantra* has been attached along with the *mantra*. The medicinal uses of the same is not enlisted as my restriction with the knowledge of medical science and also the constraint I had by having not possessed a degree in the same. Yet, in the above passages some sincere efforts by thorough reading of the medical treatises of the past has helped me in producing whatever little regarding the medicinal uses of the *vedic* plants and tree species.

²⁵⁸ A V 4 19 4

²⁵⁹ T B 1 7 1 8

- अलाबुः – *Legenaria siceraria/ Cucurbita pepo/ Lageneria vulgarts/*

Lagenaria vulgaris

सोद् अक्रामत् सा सर्पान् आगच्छत् ता सर्पा उपाह्वयन्त विषवत्य् एहीति । तस्यास् तक्षको वैशलेयो वत्स आसीद् अलाबुपात्र पात्र । ता धृतराष्ट्र अइरावतो 'धोक् ता विषम् एवाधोक् । तद् विष सर्वा उप जीवन्त्य् उपजीवनीयो भवति य एव वेद ॥²⁶⁰

She mounted up, she came unto the serpents The serpents called her, venomous! Come hither Her calf was *taksaka visāla*'soffspring a bottlegourd supplied a milking-vessel *Irāvān*'s offspring, *dhrtarāstra* milked her, and from her udder drew forth only poison That poison quickens and supports the Serpents He who knows this becomes a meet supporter

तद् यस्मा एव विदुषे'लाबुनाभिषिञ्चेत् प्रत्याह्न्यात् ॥²⁶¹

One would ward off, for him who hath this knowledge, if with a bottle-gourd he sprinkled water

आदलाबुकमेककम्॥ अलाबुकम् निखातकम् ॥²⁶²

Then too the single bottle-gourd, the bottle-gourd dug from the earth

- आञ्जनम् – *Antimonia sulphuretum/ Cassia sophera*

एतत्सर्वदेवत्य यन्नवनीत यन्नवनीतेनाभ्यङ्क्ते सर्वा एव देवता प्रीणाति प्रच्युतो वा एषाऽस्माल्लोकादगतो देवलोक यो दीक्षितोन्तरेव नवनीत तस्मान्नवनीतेनाभ्यङ्क्तेऽनु लोम यजुषा

²⁶⁰ A V 8 10 29

²⁶¹ A V 8 10 30

²⁶² A V 20 132 1&2

व्यावृत्या इन्द्रो वृत्रमतस्य कनीनिका पराऽपतत्तदाऽञ्जनमभवद्यदाङ्क्ते चक्षुरेव भ्रातृव्यस्य
वृङ्क्तेदक्षिण पूर्व माङ्क्ते ॥²⁶³

Fresh butter is connected with all the gods, verily in anointing with fresh butter he satisfies all the gods The man who is consecrated has fallen from this world and yet not gone to the world of the gods, fresh butter is as it were midway, therefore he anoints with fresh butter, along the hair, with a *yajus*, for destruction *Indra* slew *vrtra*, his eyeball fell away, it became collyrium When he anoints, verily he takes away the eye of his enemy He anoints his right eye first

- इक्षुः – *Saccharum officinarum*

परि त्वा परितत्तुनेक्षुणागाम् अविद्विषे । यथा मा कमिन्य् असो यथा मन् नापगा अस ॥²⁶⁴

Around thee have I girt a zone of sugar-cane to banish hate That thou mayst be in love with me, my darling never to depart

- उर्वारुकम् – *Musa paradisiaca*

निर् बलास बलासिन क्षिणोमि मुष्कर यथा । छिनद्म्य् अस्य बन्धन मूलम् उर्वारि इव ॥²⁶⁵

From the consumptive man I pluck Decline as 'twere a severed part I cut the bond that fetters him, even as a root of cucumber

त्र्यम्बक यजामहे सुगन्धि पुष्टिवर्धनम् । उर्वारुकमिव बन्धनान्मृत्योर्मुक्षीय मामृतात् ॥²⁶⁶

²⁶³ TS 6 1 1 5

²⁶⁴ AV 1 34 5

²⁶⁵ AV 6 14 2

Tryambaka we worship, sweet augments of prosperity As from its stem
the cucumber, so may I be released from death, not reft of immortality

त्र्यम्बक यजामहे सुगन्धि पुष्टिवर्धनम् । उर्वारुकमिव बन्धनान्मृत्योर्मुक्षीय मामृतात् । एष ते रुद्र
भागस्त जुषस्व तेनावसेन परो मूजवतो तीह्यवततधन्वा पिनाकहस्त कृत्तिवासा ॥²⁶⁷

To *tryambaka* we make offering, The fragrant, increaser of prosperity, Like
a cucumber from its stem, From death may I be loosened, not from immortality
This is thy portion, O *rudra*, rejoice in it, with it for food, do thou go away beyond
the *mujavāns* With unstrung bow, thy club in thy hand, clad in skins

- काशः – *Saccharum spontaneum/ Saccharum semidecumbens*

ऊर्ज गावो यवसे पीवो अत्तन ऋतस्य या सदने काशे अङ्गध्वे । तनूरेव तन्वो अस्तु भेषजमा
सर्वतातिमदिति वृणीमहे॥²⁶⁸

Eat strength and fatness in the pasture, kine, who are balmed at the
reservoir and at the seat of Law So let your body be our body's medicine We ask
for freedom and complete felicity

- किंशुकः – *Butea frondosa/Butea frondosa*

सुकिशुक शल्मलि विश्वरूप हिरण्यवर्ण सुवृत सुचक्रम् । आ रोह सूर्ये अमृतस्य लोक स्योन पत्ये
वहतु कृणुष्व॥²⁶⁹

²⁶⁶ R V 7 59 12

²⁶⁷ T S 1 8 6 9

²⁶⁸ R V 10 100 10

Mount this, all-shaped, gold-hued, with strong wheels, fashioned of *kimsuka* and *śalmālī*, light-rolling, bound for the world of life immortal, *sūrya* make for thy lord a happy bridal journey

- **कुमुदः** – Wood *fordia fruticosa*/ *Nymphaea alba*/ *Desmodium gangeticum*/ *Nymphaea nouchali*/ *Nymphaea pubescens*/ *Pistia stratiotes*

एष यज्ञाना विततो वहिष्ठो विष्टारिण पक्त्वा दिवम् आ विवेश। आण्ढीक कुमुद स तनोति विस शालूक शफको मुलाली। एतास् त्वा धारा उप यन्तु सर्वा स्वर्गे लोके मधुमत् पिन्वमाना उप त्वा तिष्ठन्तु पुष्करिणी समन्ता ॥²⁷⁰

Strongest is this, performed, of sacrifices he hath reached heaven who hath prepared *visṭān*। The oval-fruited lotus spreads his fibre there bloom the nelo-phar and water-lilies Abundant with their overflow of sweetness, these streams shall reach thee in the world of *svarga*, whole lakes with lotus-blossom shall approach thee

- **कुल्मषः** – *Cassia asbus*

स हेभ्य कुल्माषान्खादन्त बिभिक्षे तँ होवाच । नेतोऽन्ये विद्यन्ते यच्च ये म इम उपनिहिता इति॥ त जायोवाच हन्त पत इम एव कुल्माषा इति तान्खादित्वामु यज्ञ विततमेयाय॥²⁷¹

He *usasti* begged food from the owner of the elephant, who was eating some wretched beans He (the owner of the elephant) said "I have nothing but what is set before me His wife said to him "Here, my husband, are the beans " After eating them, he went to the sacrifice that was about to be performed

²⁶⁹ R V 10 85 20

²⁷⁰ A V 4 34 5

²⁷¹ C U 1 10 2 & 7

- कुष्ठः – *Costus speciosus*/ *Costus speciosus*/ *Saussaria lappa*

हिरण्ययी नौर् अचरद् धिरण्यबन्धना दिवि । तत्रामृतस्य पुष्प देवा कुष्ठम् अवन्वतः॥²⁷²

- Thou who wast born on mountains, thou most mighty of all plants that grow Thou banisher of fever, come, *kustha*! Make fever pass away
- Brought from the snowy mountain, born on the high hill where eagles breed, men seek to buy thee when they hear for fever's banisher they know
- In the third heaven above us stands the Asvattha tree, the seat of Gods There the Gods sought the *kustha* plant, embodiment of end- less life
- There moved through heaven a golden ship, a ship with cordage wrought of gold
There the Gods won the *kustha* plant, the blossom of eternal life
- They sailed on pathways paved with gold the oars they piled were wrought of gold All golden were the ships wherein they carried *kustha* down to earth
- O *kustha*, bring thou hitherward this man of mine, restore his health, yes, free him from disease for me
- Thou art descended from thee Gods, *soma's* benignant friend art thou, befriend my breath and vital air be gracious unto this mine eye
- Sprung, northward, from the snowy hill thou art conveyed to eastern men There they deal out among themselves *kustha's* most noble qualities Most excellent, indeed, art thou, *kustha*! Most noble is thy sire Make all Consumption pass away and render fever powerless Malady that affects the head, eye-weakness, and bodily defect All this let *kustha* heal and cure aye, godlike is the vigorous power

²⁷² A V 5 4

आञ्जनस्य मदुघस्य कुष्ठस्य नलदस्य च । तुरो भगस्य हस्ताभ्याम् अनुरोधनम् उद् भरे॥²⁷³

Swiftly from *bhaga's* hands I bear away a love-compelling charm of ointment and of sugar-cane, of spikenard and the *kustha* plant

- कोलः – *Piper nigrum/ Asteracantha longifolia/ Cassia sophera*

मनो वाच वाचो भूयो यथा वै द्वे वामलके द्वे वा कोले द्वौ वाक्षौ मुष्टिरनुभवत्येव वाच च नाम च मनोऽनुभवति स यदा मनसा मनस्यति मन्त्रानधीयीत्यथाधीते कर्माणि कुर्वीत्यथ कुरुते पुत्राँश्च पशूँश्चेच्छेयेत्यथेच्छत इमं च लोकममुं चेच्छेयेत्यथेच्छते मनो ह्यात्मा मनो हि लोको मनो हि ब्रह्म मन उपास्वेति॥²⁷⁴

The mind is, verily, greater than speech Just as the closed fist holds two *āmalakas*, or two plums, or two *aksa* fruits, so does the mind hold speech and a name For when a man thinks in his mind that he would read the sacred hymns, then he reads them When he thinks in his mind that he would perform actions, then he performs them When he thinks in his mind that he would have sons and cattle, then he desires them When he thinks in his mind that he would have this world and the other, then he desires them Mind, indeed, is the self, mind is the world, mind is *brahman* Meditate on the mind

²⁷³ A V 6 102

²⁷⁴ C U 7 3 1

- गर्भुतः – A bean

†

प्रजापति प्रजा असृजत ता अस्मात्सृष्टा पराचीरायन् ता यत्रावसन् ततो गर्भुदतिष्ठत्ता
बृहस्पतिश्चान्ववैताग् सोब्रवीद् बृहस्पतिरनया त्वा प्रतिष्ठान्यथ त्वा प्रजा उपावत्स्यन्तीति
त प्रातिष्ठत्ततो वै प्रजापति प्रजा उपावर्तन्त गर्भुत चरु निर्वपेत् प्रजापति॥²⁷⁵

Prajāpati created offspring, they created went away from him, where they stayed, thence sprung the bean Those he followed with *brhaspati*, *brhaspati* said, 'With this will I go before thee, then shall offspring have resort to thee He went before him, then indeed did offspring resort to *prajāpati* For him who desires offspring he should offer this oblation of beans to *prajāpati* verily he has recourse to *prajāpati* with his own share

एव स्वेन भागधेयेनोप धावति स एवास्मै प्रजा प्रजनयति प्रजापति पशूनसृजत तेस्मात्सृष्टा
पराञ्च आयन्ते यत्रावसन्ततो गर्भुदतिष्ठत्तान् पूषा चान्ववैताग् सोऽब्रवीत् पूषाऽनयामा प्रतिष्ठाय
त्वा पशव उपावत्स्यन्तीति मा प्रतिष्ठेति सोमोऽब्रवीन्मम वा॥²⁷⁶

Verily he produces offspring for him *Prajāpati* created cattle, they created went away from him, where they stayed, thence sprung the bean, those he followed with *pūsan*, *pūsan* said, 'With this do thou go before me, then shall cattle resort to thee Do thou go before me', said *soma*

²⁷⁵ T S 2 4 4 1

²⁷⁶ T S 2 4 4 2

- गवीधुकः – Coix barbata

पयसा जुहुयाद्गाम्यान् पशून्नुचाऽर्पयेद्यदारण्यानामारण्यान् जर्तिलयवाग्वा वा जुहुयाद्गवीधुकयवाग्वा वा न ग्राम्यान्पशून्, हिनस्ति नाऽऽरण्यानथो खल्वाहुरनाहुतिर्वै जर्तिलाश्च गवीधुकाश्चेत्यजक्षीरेण जुहोत्याग्नेयी वा एषा यदजाऽऽहुत्यैव जुहोति न ग्राम्यान्पशून्, हिनस्ति नाऽऽरण्यानङ्गिरसस्सुवर्गं लोकं यन्त ॥²⁷⁷

He would afflict domestic animals with pain, if (with that) of wild (animals), wild (animals), he should offer with groats of wild sesame or with groats of *gavīdhuka* grass, he harms neither domesticated nor wild animals. Then they say, 'wild sesame and *gavīdhuka* grass are not a proper offering', he offers with goat's milk, the female goat is connected with *agni*, verily he offers with a proper offering, he harms neither domesticated nor wild animals. The *āṅgīrasa* going to the world of heaven

- गोधूमः – Triticum aestivum

सप्तदश प्रजापति । प्रजापतेरास्यै । तूपरश्चतुरश्रिर्भवति । गौधूम चषलम् । नवा एते ब्रीहयो न यवा । यद्गोधूमा ।²⁷⁸

- चीपद्रु – Unknown foreign name

यौ ते बलास तिष्ठत कक्षे मुष्काव् अपश्रितौ । वेदाह तस्य भेषज चीपुद्रुर् अभिचक्षणम् ॥²⁷⁹

²⁷⁷ T S 5 4 3 2

²⁷⁸ T B 1 3 7 2

²⁷⁹ A V 6 1 2 7 2

Those nerves of thine, consumption, which stand closely hidden in thy groin
I know the balm for that disease the magic cure is *cipudru*

- जीवन्तः – *Cocculus cordifollus* or *Mimosa suma*

जीवला नाम ते माता जीवन्तो नाम ते पिता । नद्याय पुरुषो रिषत् ।यस्मै परिव्रवीमि त्वा
सायप्रातर् अथो दिवा॥²⁸⁰

Jivalā is thy mother's name, thy father's name is *jivalā*, let not mishap, etc

- तण्डुलः – *Oryza sativa*

उलूखले मुसले यश् च चर्मणि यो वा शूर्पे तण्डुल कण । य वा वातो मातरिश्वा पवमानो
ममाथामिष् टद् धोता सुहुत कृणोतु॥²⁸¹

Each grain of rice in mortar or on pestle, all on the skin or in the
winnowing-basket, whatever purifying *mātariśvan*, the Wind, hath sifted, let
the *hotā agni* make of it an acceptable oblation

एष म आत्मान्तर्हृदयेऽणीयान्त्रीहेर्वा यवाद्वा सर्षपाद्वा श्यामाकाद्वा श्यामाकतण्डुलाद्वैष म
आत्मान्तर्हृदये ज्यायान्पृथिव्या ज्यायानन्तरिक्षाज्यायान्दिवो ज्यायानेभ्यो लोकेभ्य ॥²⁸²

He is my Self within the heart, smaller than a grain of rice, smaller than a grain
of barley, smaller than a mustard seed, smaller than a grain of millet, He is my Self
within the heart, greater than the earth, greater than the mid-region, greater than
heaven, greater than all these worlds

²⁸⁰ A V 19 39 3

²⁸¹ A V 10 9 26

²⁸² C U 3 14 3

- तलाशः – An unidentified plant in atharvaveda

यथा सोम ओषधीनाम् उत्तमो हविषा कृत । तलाशा वृक्षाणाम् इवाह भूयासम् उत्तम ॥²⁸³

As *soma* hath been made the best of all oblations mid the plants, so, as *talāsā* is the queen of trees, may I be chief of all

- तिलम् – *Sesamum indicum*

बभ्रोर् अर्जुनकाण्डस्य यवस्य ते पलाल्या तिलस्य तिलपिङ्ग्या। वीरुत् क्षेत्रियनाशन्य अप क्षेत्रियम् उच्छतु॥²⁸⁴

With straw of barley tawny-brown in colour with its silvery ears, with stalk and stem of Sesamum- So let the plague-destroying Plant remove inherited disease

यव ग्रीष्मायौषधीर्वर्षाभ्यो ब्रीहीञ्छरदे माषतिलौ हेमन्तशिशिराभ्या तेनेन्द्र प्रजापतिरयाजयत्ततो वा इन्द्र इन्द्रोऽभवत्तस्मासाहुरानुजावरस्य यज्ञ इति स ह्येतेनाग्नेऽतजतैष ह वै कुणपमत्ति यस्सत्रे प्रतिगृह्णाति पुरुषकुणपमश्चकुणप गौर्वा अन्न येन पात्रेणान्न बिभ्रतीयत्तन्न निर्णेनिजति ततोऽधि॥²⁸⁵

To the hot season barley, to the rains plants, to autumn rice, beans and sesamum to winter and the cool season *Prajāpati* made *indra* sacrifice with it Then indeed did *indra* become *indra*, therefore they say, it is the sacrifice of the inferior, for he by it first sacrificed He eats a corpse who accepts a present at a *sattra*, a human corpse or the corpse of a horse Food is the cow, in that he does not purify the vessel in which they carry food, filth is produced from it

²⁸³ A V 6 15 3

²⁸⁴ A V 2 8 3

²⁸⁵ T S 7 2 10 2

- त्रपुः – *Cucumis sativus*

त्रपु भस्म हरित वर्ण पुष्करम् अस्य गन्ध ॥²⁸⁶

Tin is its ashes, gold its colour, the blue lotus flower its scent

अश्मा च मे मृत्तिका च मे गिरयश्च मे पर्वताश्च मे सिकताश्च मे वनस्पतयश्च मे हिरण्य च मेऽयश्च
मे सीस च मे त्रपुश्च मे श्याम च मे लोह च मेऽग्निश्च म आपश्च मे वीरुधश्च म ओश् अद्यश्च मे
कृष्टपच्य च॥²⁸⁷

Homage to him of the drum, and to him of the drumstick Homage to the bold, and to the cautious Homage to the messenger, and to the servant Homage to the quiver-bearer, and to the owner of the quiver Homage to him of the sharp arrow, and to him of the weapon Homage to him of the good weapon, and to him of the good bow Homage to him of the stream,' and to him of the way Homage to him of the hole,' and to him of the pool Homage to him of the ditch, and to him of the lake Homage to him of the stream, and to him of the tank Homage to him of the cistern, and to him of the well Homage to him of the rain, and to him not of the rain Homage to him of the cloud, and to him of the lightning Homage to him of the cloudy sky, and to him of the heat Homage to him of the wind, and to him of the storm Homage to him of the dwelling, and to him who guardeth the dwelling

हिरण्य च मेयश्च मे सीस च मे त्रपुश्च मे श्याम च मे लोह च मे॥²⁸⁸

²⁸⁶ A V 1138

²⁸⁷ T S 4751

²⁸⁸ T S 4751

May I for me the stone, clay, hills, mountains, sand, trees, gold, bronze, lead, tin, iron, copper, fire, water, roots, plants, what grows on ploughed land, what grows on unploughed land, tame and wild cattle prosper through the sacrifice, may for me wealth and gaining wealth, attainment and attaining, riches, dwelling, act, power, aim, strength, moving and going (prosper through the sacrifice)

जीवला नघारिषा जीवन्तीम् ओषधीम् अहम् । त्रायमाणा सहमाना सहस्वतीम् इह हुवे'स्मा अरिष्टतातये॥²⁸⁹

Here for sound health I invoke a living animating plant, preserving, queller of disease, victorious, full of power and might

- दधि – *Feronia Elephasum*

शुचिरसि पुरुनिष्ठा क्षीरैर्मध्यत आशीर्त । दध्ना मन्दिष्ठ शूरस्य॥²⁹⁰

Pure art thou, set in many a place, and blended in the midst with milk And curd, to cheer the hero best

एमा कुमारस् तरुण आ वत्सो जगता सह । एमाम् परिस्तुत कुम्भ आ दध्न कलशैर् अगु ॥²⁹¹

To this the tender boy hath come, to this the calf with all the beasts, to this crock of foaming drink, hither with jars of curdled milk

²⁸⁹ A V 8 2 6

²⁹⁰ R V 8 2 9

²⁹¹ A V 3 12 7

- दर्भा – Impereta cylindrical/ Poa syanossuroides

शरास कुशरासो दर्भास सैर्या उत । मौञ्जा अदृष्टा वैरिणा सर्वे साक न्यलिप्सत॥²⁹²

Pure art thou, set in many a place, and blended in the midst with milk and curd, to cheer the hero best

देवतायामाधाय ब्रह्मवर्चसी भवति दर्भैरा दधात्ययातयामत्वाय दर्भैरा दधात्यद्भ्य ॥²⁹³

He who knows his connexions becomes possessed of connexions himself *Agni* desiring a share after being established assailed the offspring and cattle of the sacrifice Having removed it, one should re-establish it, thus he unites him with his own portion, verily he is appeased He should establish under *punarvasu*, *punarvasu* is the Nakshatra for the re-establishing, verily by establishing it under its own deity he becomes resplendent He establishes with *darbhā* grass, for variety He establishes with *darbhā*, verily winning it from the waters and the plants he establishes it The sacrificial cake is offered on five potsherds, the seasons are five, verily he wins it from the seasons and establishes it

- दूर्वा – Cynodon dactylon/ Panicum dactylon

य त्वमग्ने समदहस्तमु निर्वापया पुन । कियाम्ब्वत्र रोहतु पाकदूर्वा व्यल्कशा॥ एवा नो दूर्वे प्रतनु सहस्रेण शतेन च।²⁹⁴

May *agni* protect thee with great prosperity, with most auspicious covering, with that deity, in the manner of *angīrasa*, do thou sit firm Arising from every stem, from every joint, do thou, O *dūva*, extend us with a thousand, a hundred

²⁹² R V 1 191 3

²⁹³ T S 1 5 1 4

²⁹⁴ T S 4 2 9 2

- धवः - *Anogesissus latifolia*

भद्रात् प्लक्षान् निस् तिष्ठस्य अश्वत्थात् खदिराद् धवात् । भद्रान् न्यग्रोधात् पर्णात् सा न एह्य्
अरुन्धति॥²⁹⁵

Thou springest from blest *plaksa*, or *asvattha*, *dhava*, *khadira*, *parna*, or
blest *nyagrodha*, so come thou to use, *arundhati*!

- धाना - *Coriandrum sativum*/ Barley or rice/ Coriander/ *Cyperus rotundus*

इमा धाना घृतस्रुवो हरी इहोप वक्षत । इन्द्र सुखतमे रथे॥²⁹⁶

Here are the grains bedewed with oil hither let the bay coursers bring
Indra upon his easiest car

यास् ते धाना अनुकिरामि तिलमिश्रा स्वधावती । तास् ते सन्तु विभ्वी. प्रभ्वीस् तास् ते यमो
राजानु मन्यताम्॥²⁹⁷

Grains which for thee I scatter, mixt with Sesamum, as holy food, they for
thee may be excellent and potent King Yama look on them as thine with favour!

सप्तदशेन ह्रियमाणो व्यलेशिषि। भिषज्यतमेति। तमश्चिनौ धानाभिरभिषज्यताम्। पूषा
करम्भेण॥²⁹⁸

²⁹⁵ A V 5 5 5

²⁹⁶ R V 1 16 2

²⁹⁷ A V 18 3 69

²⁹⁸ T B 1 5 11 2

- धान्यम् – *Coriandrum sativa/ Sida acuta/ Corn/ Oryza sativa*

यस्ते सूनो सहस्रो गीर्भिरुक्थैर्यज्ञैर्मर्तो निशिति वेद्यानट् । विश्व स देव प्रति वारमग्ने धत्ते धान्य
पत्यते वसव्यै ॥²⁹⁹

The man who, son of strength I with sacrifices, hymns, lauds, attracts thy
fervour to the altar, enjoys each precious thing, O God, O *agni*, gains wealth of corn
and is the lord of treasures

वेदाह पयस्वन्त चकार धान्यम् बहु । सभृत्वा नाम यो देवस् त वय ह्वामहे योयो अयज्वनो
गृहे ॥³⁰⁰

Him who is rich in milk I know Abundant hath he made our corn The God
whose name is gatherer, him we invoke who dwelleth in his house who sacrifices
not

उद् उत्स शतधार सहस्रधारम् अक्षितम् । एवास्माकेद धान्य सहस्रधारम् अक्षितम् ॥³⁰¹

Open the well with hundred streams, exhaustless, with a thousand streams So
cause this corn of ours to be exhaustless, with a thousand streams

- नवनीतः – *Butyrum depuratum*

यन्नवमैत्तन्नवनीतमभवद्यदसर्पत्तत्सर्पिरभवद्यदध्रियत तद्धृतमभवदश्विनो प्राणोसि ॥³⁰²

²⁹⁹ R V 6 13 4

³⁰⁰ A V 3 24 2

³⁰¹ A V 3 24 4

³⁰² T S 2 3 10 1

What went new that became fresh butter, what crept that became clarified butter,
that which became firm became ghee

- **पयः – Ipomoea digitata**

गौरमीमेदनु वत्स मिषन्त मूर्ध्ना हिङ्ङकृणोन्मातवा उ । सृक्काण घर्ममभि वावशाना मिमाति मायु
पयते पयोभि ॥³⁰³

The cow hath lowed after her blinking youngling, she licks his forehead, as
she lows, to form it His mouth she fondly calls to her warm udder, and suckles him
with milk while gently lowing

आयम् अगन् पर्णमणिर् बली बलेन प्रमृणन्त् सपत्नान् । ओजो देवाना पय ओषधीना वर्चसा मा
जिन्वन्त् अप्रयावन्॥³⁰⁴

This *parna*-amulet hath come, strong and destroying with its strength my
rivals The power of the Gods, the plants' sweet essence, may it incite me
ceaselessly with vigour

- **पयस्यः – Ipomoea paniculata**

गृहीतस्स्यात्तस्मा एतामैन्द्रावरुणी पयस्या निर्वपेदिन्द्र एवास्मिन् इन्द्रिय दधाति॥³⁰⁵
पूषा करम्भेण। भारती परिवापेण। मित्रावरुणौ पयस्यया। तदाहु ।³⁰⁶

He puts down the cake, verily he makes him possessed of a body, and also

³⁰³ R V 1 164 28

³⁰⁴ A V 3 5 1

³⁰⁵ T S 2 3 13 2

³⁰⁶ T B 1 5 11 2

possessed of an abode He separates it into four pieces, verily he finds supports in the quarters, he unites (the fires) again, verily he procures healing for him from the quarters, having united (them) he cuts off (portions), that is as when one cuts up what has been pierced That disease of yours, O *indra* and *varuna*, that is in the fire, that of yours I appease hereby, he says, verily he protects him from error in sacrifice 'That disease of yours, O *indra* and *varuna*, that is in the two footed cattle, that of yours I appease hereby', he says, so many are the waters, the plants, the trees, offspring and cattle on whom to live, verily does he free them for him from *varuna's* noose

- परुषः – *Grewia subinaequalis*

परुषान् अमून् परुषाहव कृणोतु हन्तु एनान् वधको वधै । क्षिप्र शर इव भजन्ता बृहज्जालेन सदिता ॥³⁰⁷

Let *parushāhva* make them reeds, and let the bulrush strike them down Bound in a mighty net let them break quickly like an arrow's shaft

- पर्णम् – *Butea monosperma/ Butea fronds*

अश्वत्थे वो निषदन पर्णे वो वसतिष्कृता । गोभाज इत्किलासथ यत्सनवथ पूरुषम्॥³⁰⁸

The holy fig tree is your home, your mansion is the *parna* tree winners of cattle shali ye be if ye regain for me this man

³⁰⁷ A V 8 8 4

³⁰⁸ R V 10 97 5

भद्रात् प्लक्षान् निस् तिष्ठस्य अश्वत्थात् खदिराद् धवात् । भद्रान् न्यग्रोधात् पर्णात् सा न एह्य्
अरुन्धति॥³⁰⁹

Thou springest from blest *plaksa*, or *aśvattha*, *dhava*, *khadira*, *parna*, or blest
nyagrodha, so come thou to use, *arundhatī*

- पलालः - Straw

पलालानुपलालौ शर्कु कोक मलिम्लुच पलीजकम् । आश्रेष वन्निवाससम् ऋक्षग्रीव प्रमीलिनम्॥³¹⁰

Palāla, *anupalāla*, *śarku*, *koka*, *malimlucha*, *palījakam* *vavrivāsas* and *asresha*,
rksigrīvam and *pramīlin*

- पाठा – *Cocculus hirsutus*/ *Cissampelos pareria*/ *Stephania*
hernandifolia/ *Cylea peltata*/ *Cyclea arnaatti*

पाटाम् इन्द्रो व्य आश्नाद् असुरेभ्य स्तरीतवे । प्राश प्रतिप्राशो जह्य् अरसान् कृण्व ओषधे॥³¹¹

Indra devoured the *pāthā* plant that he might lay the *asuras* low Refute mine
adversary's speech! Render them dull and flat, O plant

- पिप्पली – *Piper longum*/ *Chavica roxburghii*

पिप्पली क्षिप्तभेषज्य उतातिविद्धभेषजी । ता देवा सम् अकल्पयन् इय जीवितवा अलम्॥³¹²

³⁰⁹ A V 5 5 5

³¹⁰ A V 8 6 2

³¹¹ A V 2 27 4

³¹² A V 6 109 1

The berry heals the missile's rent, it heals the deeply-piercing wound The
Gods prepared and fashioned it This hath sufficient power for life

पिप्पल्यं सम् अवदन्तायतीर् जननाद् अग्निः । य जीवम् अश्र्वामहै न स रिष्याति पूरुष ॥³¹³

When from their origin they came, the berries spake among themselves
The man whom we shall find alive shall never suffer injury

- **पुण्डरीकः** – *Artemisia vulagris/ Boerhavia diffusa/ Nelumbium speciosum*

आयने ते परायणे दूर्वा रोहन्तु पुष्पिणी । हृदाश्च पुण्डरीकाणि समुद्रस्य गृहा इमे ॥³¹⁴

On thy way hitherward and hence let flowery *dūrvā* grass spring up Let there
be lakes with lotus blooms These are the mansions of the flood

जामि वा एतत्कुर्वन्ति । यत्सद्यो दीक्षयन्ति सद्यस्सोमक्रीणन्ति । पुण्डरिस्रजा प्रयञ्चत्यजामित्वाय ।
अगिरसस्सुवर्गलोकयन्त । अप्सु दीक्षा तपसी प्रावेशयन् । तत्पुण्डरीकमभवत् ॥³¹⁵

- **पुष्करः** – *Nelumbo nucifera/ Costus speciosus/Saussurea auriculata/ Blue lotus/ Iris Germanica*

त्वामग्ने पुष्करादध्यथर्वा निरमन्थत । मूर्ध्नो विश्वस्य वाघत ॥³¹⁶

Agni, atharvan brought thee forth, by rubbing, from the lotus-flower, the
head of *viśva*, of the priest

³¹³ A V 6 109 2

³¹⁴ R V 10 142 8

³¹⁵ T B 1 8 2 1

³¹⁶ R V 6 16 13

त्रपु भस्म हरित वर्णं पुष्करम् अस्य गन्धः ॥³¹⁷

Tin is its ashes, gold its colour, the blue lotus flower its scent

- पूतीका – *Caesalpinia bonducella*/ *Basella rubra*/ *Guilandina bonducella*

यथापोर्वमुपैति यत् पूतीकैर्वा पर्णवल्कैः ॥³¹⁸

One should disregard that and offer ready (milk) first, verily one places power and strength in him and later impels him by curds, and he proceeds in order (of production) If he curdles it with *putikā* plants or with bark, that is fit for *soma*, if with jujubes, that is for the *rāksasas*, if with rice grains, for the all-gods, if with rennet, for men, if with curds, that has *indra* He curdles it with curds

- पृश्निपर्णिः – *Uvaria lagopoides*/ *Uvaria picta*/ *Uvaria logopoides*/ *Hemionitis cordifolia*

श नो देवी पृश्निपर्ण्यं अशं निरृत्या अक । उग्रा हि कण्वजम्भनी ताम् अभक्षि सहस्वतीम् ॥³¹⁹
सहमानेयं प्रथमा पृश्निपर्ण्यं अजायत । तयाह दुर्गाम्ना शिरो वृश्चामि शकुनेर् इव ॥³²⁰ अरायम्
असृक्पावानं यश् च स्फाति जिहीर्षति । गर्भाद कण्वं नाशय पृश्निपर्णिं सहस्व च ॥³²¹ गिरिम् एना
आ वेशय कण्वान् जीवितयोपनान् । तास् त्व देवि पृश्निपर्ण्यं अग्निर् इवानुदहन् इहि ॥³²² पराच
एनान् प्र णुद कण्वान् जीवितयोपनान् । तमासि यत्र गच्छन्ति तत् क्रव्यादो अजीगमम् ॥³²³

³¹⁷ A V 11 3 8

³¹⁸ T S 2 5 3 5

³¹⁹ A V 2 21

³²⁰ A V 2 22

³²¹ A V 2 23

³²² A V 2 24

³²³ A V 2 25

- बल्बजः – Unknown foreign name

इध्मे सन्नह्येद्वैर्यत्राधिष्कन्नान्यमेहत्ततो बल्बजा उदतिष्ठन्नावामेवैनम्॥³²⁴

Where the cow being covered made water, thence grew the *balbaja*, verily making him follow the way of the cows he causes him to obtain cows To *indra*, the angry, the wise, he should offer a cake on eleven potsherds when battle is joined, with power, with anger, and with wisdom one wins the battle, verily he has recourse to Indra, the angry, the wise, with his own share, verily he bestows upon him power, anger, and mind, he wins

- बिसः – *Nelumbo nucifera*

एष यज्ञानां विततो वहिष्ठो विष्टारिण पक्त्वा दिवम् आ विवेश । आण्डीक कुमुद स तनोति बिस
शालूक शफको मुलाली । एतास् त्वा धारा उप यन्तु सर्वा स्वर्गे लोके मधुमत् पित्वमाना उप त्वा
तिष्ठन्तु पुष्करिणी समन्ता ॥³²⁵

Strongest is this, performed, of sacrifices he hath reached heaven who hath prepared vishthārī The oval-fruited lotus spreads his fibre there bloom the nelo-phar and water-lilies Abundant with their overflow of sweetness, these streams shall reach thee in the world of Svarga, whole lakes with lotus-blossom shall approach thee

³²⁴ T S 2 2 8 2

³²⁵ A V 4 34 5

- **मधुघः – Bassia latifolia/ Cynometra mimosoides**

घृतवती भुवनानामभिश्चियोर्वी पृथ्वी मधुदुघे सुपेशसा । द्यावापृथिवी वरुणस्य धर्मणा विष्कभिते
अजरे भूरिरेतसा॥³²⁶

Filled full of fatness, compassing all things that be, wide, spacious, dropping
meath, beautiful in their form, the heaven and the earth by *varuna's* decree,
unwasting, rich in germs, stand parted each from each

मधु नो द्यावापृथिवी मिमिक्षता मधुश्चुता मधुदुघे मधुव्रते । दधाने यज्ञ द्रविण च देवता महि श्रवो
वाजमस्मे सुवीर्यम्॥³²⁷

May heaven and earth pour down the balmy rain for us, balm-dropping,
yielding balm, with balm upon your path, bestowing by your godhead sacrifice and
wealth, great fame and strength for us and good heroic might

मधोर् अस्मि मधुतरो मदुघान् मधुमत्तर । माम् इत् किल त्व वना शाखा मधुमतीम् इव॥³²⁸

Sweeter am I than honey, yet more full of sweets than licorice So mayst thou
love me as a branch full of all sweets, and only me

आञ्जनस्य मदुघस्य कुष्ठस्य नलदस्य च । तुरो भगस्य हस्ताभ्याम् अनुरोधनम् उद् भरे॥³²⁹

Swiftly from *bhaga's* hands I bear away a love-compelling charm of ointment
and of sugar-cane, of spikenard and the *kustha* plant

³²⁶ R V 6 70 1

³²⁷ R V 6 70 5

³²⁸ A V 1 34 4

³²⁹ A V 6 102 3

- **माषः – Vigna mungo/ Phaseolus radiatus**

एकविंशत्या माषैः पुरुषशेर्षमुच्चैत्यमेध्या वै माषा अमेध्यः॥³³⁰

With twenty-one beans he approaches the head of the man, beans are impure, the man's head is impure, verily by the impure he redeems its impurity and making it pure takes it There are twenty-one, man is composed of twenty-one parts, (verily they serve) to obtain man The man's head is impure as bereft of the breaths, he deposits (it near) an ant-heap pierced in seven places, the breaths in the head are seven, verily he unites it with the breaths, to make it pure

- **मुञ्जः – Saccharum officinarum/ Saccharum munja/ Saccharum arundinaceum**

अवरुन्धे मुजानव दधात्यूर्ध्वं मुजा ऊर्जमेवास्मापि दधाति॥³³¹

He deposits *muñja* grass, *muñja* is strength, verily he bestows upon him strength *Agni* departed from the gods, he entered the *krumuka* wood, he deposits *krumuka*, verily he wins what of *agni* is there imbued With butter he joins (it), butter is the dear home of *agni*, verily he unites him with his dear abode, and with brilliance also

- **यवः – Hordeum vulgare/ Hordeum hexastichum/ Holarrhena antidysentrica**

क्रूरमिव वा एतत्करोति यत्खनत्यपोव नयति शान्त्यै यवमतेरवनयत्यूर्ध्वं यव ऊर्गुदुम्बर ऊर्जैर्वोर्जग

³³⁰ TS 5181

³³¹ TS 5195

समर्धयति॥³³²

Men live on strength from the top downwards Now he does a cruel deed in that he digs, he pours down water, for atonement He pours down (water) mixed with barley, barley is strength, the *udumbara* is strength, verily he unites strength with strength (The post) is of *udumbara* wood of the height of the sacrificer As great as is the sacrifice, so much strength does he put in it 'Thou art the seat of the *pitr*', (with these words) he spreads the strew, for what is dug in has the *pitr* for its deity

- रजतम् - **Argentum**

रजतम् हिरण्यमभवत् तस्माद्रजतम् हिरण्यमदक्षिण्यमश्रुजम् हि यो बर्हिषि दधाति³³³

(The tear that) was shed became silver, therefore silver is not a suitable gift, for it is born of tears He who gives on the strew, in his house before the year is out they weep, therefore one should not give on the strew *Agni* said, 'Let me have a share, then this will be yours ' They replied, 'The re-establishing shall be thine alone ' 'He shall prosper', he said, who shall establish the fire with me as its divinity ' *Pūsan* established it, therefore

- लवणम् – **Bacopa monniera**

आ सुन्नस सुन्नसो असतीभ्यो असत्तरा । सेहोर् अरसतरा लवणाद् विकलेदीयसी ॥³³⁴

Rapidly dropping, quick to drop, more evil than the evil ones, more sapless than a dried-up bone, swifter than salt to melt away

³³² T S 6 2 10 3

³³³ T S 1 5 1 2

³³⁴ A V 7 76 1

तद्यथा लवणेन सुवर्णे सन्दध्यात्सुवर्णेन रजतं रजतेन त्रपु त्रपुणा सीसं सीसेन लोहं लोहेन दारु दारु
चर्मणा॥³³⁵

- लाक्षा - *Rosa damascena/ Cocos latea*

हिरण्यवर्णे सुभगे शुष्मे लोमशवक्षने । अपाम् असि स्वसा लाक्षे वातो हात्मा बभूव ते॥³³⁶

Gold-coloured, bringing happy fate, odorous, hairy-bodied one, the sister of the
Waters art thou, *lākshā*¹ and thy soul is wind

- वल्कः - *Areca Catechu*

त अदारा अभवन्। इन्द्रो ब्रत्रमहन्। तस्य वल्क परापतत्। तानि फाल्गुनान्यभवन्। पशवो वै
फाल्गुनानि। पशव सोमो राजा॥³³⁷

- विषाणकः – *Odina pinnata/ Cassia angustifolia/ Asclepias geminata*

रुद्रस्य मूत्रम् अस्य् अमृतस्य नाभि । विषाणका नाम वा असि पितृणा मूलाद् उत्थिता
वातीकृतनाशनी॥³³⁸

Thou art the stream that *rudra* pours, the closest kin of *amrita* Thy name is
called *vishānakā* thou sprangest from the fathers' root, removing illness caused by
wind

³³⁵ C U 4 17 7

³³⁶ A V 5 5 7

³³⁷ T B 1 4 7 6

³³⁸ A V 6 44 3

- वेतसः – *Calamus rotang/ Coriandum sativum*

एता अर्षन्ति हृद्यात्समुद्राच्छतव्रजा रिपुणा नावचक्षे । घृतस्य धारा अभि चाकशीमि हिरण्ययो
वेतसो मध्य आसाम्॥³³⁹

From inmost reservoir in countless channels flow down these rivers which
the foe beholds not I look upon the streams of oil descending, and lo! The Golden
Reed is there among them

दक्षिणतोन्वेषा पशूना वैतस कटो भवत्यप्सुयोनिर्वा अश्व ॥³⁴⁰

He overcomes he overcomes *brāhman*-slaying who sacrifices with the
horse sacrifice, and he who knows it thus It was the left eye of *prajāpati* that
swelled, therefore they cut off from the horse on the left side, on the right from other
animals The mat is of reeds, the horse has its birthplace in the waters, the reed is
born in the waters, verily he establishes it in its own birthplace The *stoma* is the
fourfold one, the bee tore the thigh of the horse, the gods made it whole with the
fourfold *stoma*, in that there is the fourfold *stoma*, (it is) to make whole the horse

- व्रीहिः – *Oryza sativa*

व्रीहिम् अत्त यवम् अत्तम् अथो माषम् अथो तिलम् । एष वा भागो निहितो रत्नधेयाय दन्तौ मा
हिसिष्ट पितरम् मातर च॥³⁴¹

³³⁹ R V 4 58 5

³⁴⁰ T S 5 3 12 2

³⁴¹ A V 6 140 2

Two tigers have grown up who long to eat the mother and the sire Soothe,
brahmanaspati, and thou, O *jātavedas*, both these teeth

ग्रीष्मायोषधेर्वर्षाभ्यो ब्रीहीछरदे माषतिलो हेमन्तशिशिराभ्या॥³⁴²

One should sacrifice by oneself, for *prajāpati* prospered by himself One
should be consecrated for twelve nights, the year consists of twelve months,
prajāpati is the year, he is *prajāpati*, he is born indeed who is born from fervour
The twelve *upasads* are these four sets of three nights, with the first three he
prepares the sacrifice, with the second three he grasps the sacrifice

- शाणः – *Crotalaria juncea*

शणश् च मा जङ्गिदश् च विष्कन्धाद् अभि रक्षताम् । अरण्याद् अन्य आभृत कृष्या अन्यो
रसेभ्य ॥³⁴³

May cannabis and *jāṅgīda* preserve me from *viskhanda* that brought to us
from the forest, this sprung from the saps of husbandry

- शरः – *Saccharum munja*

शरास कुशरासो दर्भास सैर्या उत । मौञ्जा अदृष्टा वैरिणा सर्वे साक न्यलिप्सत॥³⁴⁴

Śara grass, *darbhā*, *kuśāra*, and *saīrya*, *muñjā* vīrana, where all these
creatures dwell unseen, with poison have infected me

³⁴² T S 7 2 10 3

³⁴³ A V 2 4 5

³⁴⁴ R V 1 191 3

वि ते मद मदावति शरम् इव पातयामसि । प्र त्वा चरुम् इव येषन्त वचसा स्थापयामसि॥³⁴⁵

Intoxicater! Like a shaft we make thy spirit fly away, like a pot boiling on the fire, we with our word remove thee hence

रथस्त्रुतीय यूपस्तृतीय येन्तश्शरा आशीर्यन्तताश्शर्करा अभवन्॥³⁴⁶

That is a contiguous place of sacrifice He conquers (*apnoti*) his foe, his foe conquers him not On a place of sacrifice which is elevated in one place he should make him to sacrifice who desires cattle The *āngirasa* produced cattle from a place of sacrifice elevated in one place It should be elevated between the seat and the oblation-holders That is a place of sacrifice elevated in one place, verily he becomes possessed of cattle On a place of sacrifice which is elevated in three places should he make him to sacrifice who desires heaven The *āngirasa* went to the world of heaven from a place of sacrifice elevated in three places It should be elevated between the *āhavanīya* fire and the oblation holder

- श्यामाकः – *Echinochloa frumentaceum*/ *Echinochloa crusgalli*

वैश्वदेव चरुं प्रथमजो वत्सो दक्षिणा सौम्यग्ं श्यामाक चरु वासो दक्षिणा सरस्वत्यै चरुम्³⁴⁷ .

On eleven potsherds, the sacrificial fee is gold (He offers) to *indra* on eleven potsherds, the sacrificial fee is a bull as a beast of burden (He offers) to *agni* on eight potsherds, and curds to *indra*, the sacrificial fee is a bull as a beast of burden (He offers) to *indra* and *agni* on twelve potsherds, and an oblation (*caru*) to the all-gods, the sacrificial fee is a first-born calf (He offers) an oblation of millet to

³⁴⁵ A V 4 7 4

³⁴⁶ T S 6 2 6 2

³⁴⁷ T S 1 8 1 2

soma, the sacrificial fee is a garment (He offers) an oblation to *sarasvatī*, and an oblation to *sarasvant*, the sacrificial fee is a pair of oxen

- सर्षपः – *Brassica compestris*

एष म आत्मान्तर्हृदयेऽणीयान्त्रीहेर्वा यवाद्वा सर्षपाद्वा श्यामाकाद्वा श्यामाकतण्डुलाद्वैष , म
आत्मान्तर्हृदये ज्यायान्पृथिव्या ज्यायानन्तरिक्षाज्यायान्दिवो ज्यायानेभ्यो लोकेभ्य ॥³⁴⁸

He is my Self within the heart, smaller than a grain of rice, smaller than a grain of barley, smaller than a mustard seed, smaller than a grain of millet, He is my Self within the heart, greater than the earth, greater than the mid—region, greater than heaven, greater than all these worlds

- सहः – *Rosa damascena*

पञ्च राज्यानि वीरुधा सोमश्रेष्ठानि ब्रूम । दर्भो भङ्गो यव सहस् ते नो मुञ्चन्त्व अहस ॥³⁴⁹

To the five kingdoms of the plants which *soma* rules as Lord we speak *Darbhā*, hemp, barley, mighty power may these deliver us from woe

- सहदेवः – *Sida cordifolia/ Veronia cinera*

शर्म यच्छत्व ओषधि सह देवीर् अरुन्धती । करत् पयस्वन्त गोष्ठम् अयक्ष्मा उत पूरुषान्॥³⁵⁰

Let the plant give us sheltering aid, *arundhati* allied with Gods, avert consumption from our men and make our cow-pen rich in milk

³⁴⁸ C U 3 14 3

³⁴⁹ A V 11 6 15

³⁵⁰ A V 6 59 2

- सीसः – No foreign name found

नढम् आ रोह न ते अत्र लोक इद सीस भागधेय त एहि । यो गोषु यक्ष्म पुरुषेषु यक्ष्मस् तेन त्व
साकम् अधराङ् परेहि॥³⁵¹

This is no place to hold thee, mount the *nada* this lead is thine appointed
share Come hither Together with Consumption in the cattle, Consumption in
our men, go hencee, go southward

सीसे मृदुद्वह्व नढे मृदुद्वह्वम् अग्नौ सकसुके च यत् । अथो अव्या रामाया शीर्षक्तिम् उपबर्हणे॥³⁵²

Wipe all away on lead and reed, on *agni*, him who breaketh up, then on a
black-hued sheep, and on a cushion pain that racks, the head

- सुगन्धितेजन – A fragrant grass

वनस्पतिष्ववसत्ता पूतुद्रौयामोषधीषु ताग् सुगन्धितेजने या पशुषु ता पेट्वस्यान्तरा॥³⁵³

Agni had three elder brothers They perished when carrying the offering to
the gods *Agni* was afraid, 'This one here will come to ruin ' He went away The
(night) he spent among the trees was with the *Butea frondosa* the (night) among the
plants was with the *Sugandhitejana*, the (night) among the cattle was between the
horns of a ram The gods sought to start him forth They found him, and said to
him

³⁵¹ A V 12 2 1
³⁵² A V 12 2 19
³⁵³ T S 6 2 8 4

- सुरा – *Plumbago zeylancia*

युव नरा स्तुवते पञ्जियाय कक्षीवते अरदत पुरधिम् । कारोतराच्छफादश्वस्य वृष्ण शत कुम्भो
असिञ्चत सुराया ॥³⁵⁴

O Heroes, ye gave wisdom to *kaksīvān* who sprang from *payra's* line, who
sang your praises Ye poured forth from the hoof of your strong charger a hundred
jars of wine as from a strainer

घृतहृदा मधुकूला सुरोदका क्षीरेण पूर्णा उदकेन दध्ना । एतास् त्वा धारा उप यन्तु सर्वा स्वर्गे
लोके मधुमत् पिन्वमाना उप त्वा तिष्ठन्तु पुष्करिणी समन्ता ॥³⁵⁵

Full lakes of butter with their banks of honey, flowing with wine, and milk and
curds and water, abundant with their overflow of sweetness, these streams
shall reach thee in the world of *svarga*, whole lakes with lotus-blossom shall
approach thee

- सैन्धवम् - No equivalent English or Latin name

विष्वञ्चस् तस्माद् यक्ष्मा मृगा अश्वा इवेरते । यद् गुल्गुलु सैन्धव यद् वाप्य् असि समुद्रियम्॥³⁵⁶

Consumptions flee apart from it as from a wild beast fly the deer If thou, O
Bdellium, art produced from *sindhu* or hast come from sea, the quality of both
have I taken to keep this man unscathed

स्थावराभ्यस्स्वाहा नादेयीभ्यस्स्वाहा सैन्धवीभ्यस्स्वाहा समुद्रियाभ्यस्स्वाहा सर्वाभ्यस्स्वाहा॥³⁵⁷

³⁵⁴ R V 1 116 7

³⁵⁵ A V 4 34 6

³⁵⁶ A V 19 38 12

To (the waters of) wells hail! To those of the pools hail! To those of the clefts hail! To those of holes hail! To those which are dug for hail! To those of lakes hail! To those of morasses hail! To those of ponds hail! To those of tanks hail! To those of marshes hail! To those of rain hail! To those without rain hail! To those of hail hail! To those of rime hail! To those which glide hail! To those which are stagnant hail! To those of the streams hail! To those of the rivers hail! To those of the ocean hail! To all hail!

- सैर्यः - A kind of grass

शरास कुशरासो दर्भास सैर्या उत । मौञ्जा अदृष्टा वैरिणा सर्वे साक न्यलिप्सत॥³⁵⁸

Śara grass, *darbhā*, *kuśāra*, and *saīrya*, *muñjā vīana*, where all these creatures dwell unseen, with poison have infected me

- हारिद्रवः – No foreign name found

शुकेषु मे हरिमाण रोपणाकासु दध्मसि । अथो हारिद्रवेषु मे हरिमाण नि दध्मसि॥³⁵⁹

To parrots and to starlings let us give away my yellowness, or this, my yellowness let us transfer to *haritāla* trees

³⁵⁷ T S 7 4 13 1

³⁵⁸ R V 1 191 3

³⁵⁹ R V 1 50 12

Chapter 5:

Analysis and examining by facts and proofs

The concluding remarks would here be an inference based on the work done so far. If we can cull out from the *vedas* at this juncture so much of information regarding the plants and tree species of different varieties and also show its relevance to the current world insofar, we can just imagine how much more our ancients would have optimally used the plants and trees to bring about a total harmony in the society. In today's age due to pollution of all the major natural resources the quality of the natural resources is deteriorating. So, obvious it is that the quality of plants and trees available today has less efficacy and potential. Hence, one can only just positively speculate such an age when human beings and plants and trees lived mutually and co-existed peacefully.

What can be our role to bring about a small amount of parity, in such a chaotic situation is the question we need to answer to ourselves. If done so, probably individuals inclined in this particular field can create small forums and fraternities to practically implement the knowledge of the past in today's light and reinforce the lost harmony.

Our survey of the genesis and development of ancient science of agriculture shows that after it has reached a certain state of perfection there has been no further improvement in the method of cultivation, no accurate observation and no useful experiment. Here one ray of hope was Jagadish Chandra Bose, who did a tremendous work to show how plants have life and how they worked with wireless technology system and all these were based on Indian scriptures with the help of western devices though. His work however was too scientific, but of very less importance to us from the development of ancient agricultural science and ancient botanical perspectives. Important paper titled "On the similarity of effect of electric stimulus on inorganic and living substances", was presented in 1900 at the International Congress of Physics held in Paris, France, by Sir Bose. His

Outstanding inventions far ahead of their time do stand in need of original means and instruments, too. For composing his world famous *astādhyāyī*, *pāṇini*, the famous grammarian of *samskṛtam*, invented his own technique. For his investigation in the responses of the inorganic and living matter to various stimuli, *ācārya* Bose, too, devised his instrument '*crescograph*', which in measuring accuracy was decades ahead of his time. He compared the response of metals, plants, and animals to electrical, chemical, and mechanical stimulations, and documented them in his famous book "Response in the Living and Non-Living", published in 1902. The outcome of his investigations and research experiments related to plants can be summed up in a nontechnical language in the following statements:

- 1 The growth-rate, and the actual moment of death of a plant could be measured and recorded accurately (with the help of the *crescograph*)
- 2 Responses of the plants to stimulations of heat, light, gravity, and electricity, too can be measured and recorded accurately
- 3 As a result of the accuracy it is possible to compare these responses with those of the nonliving matters like metals and so on
- 4 It is obvious from statement nos. 1, 2, and 3 that in the experiments, plants represent 'living matters' while metals represent 'the nonliving'
- 5 That plants are living matters is, therefore, already an established and accepted fact for *ācārya* Bose. The thought could be absorbed from tradition and culture as it naturally percolated through ancient Sanskrit literature
- 6 As living matters, plants respond to stimuli as if they have nervous systems like animals
- 7 After studying the effect of microwaves, chemicals, and temperatures on the plant tissues and the corresponding changes in their cell membranes, *ācārya* Bose proved that plants can 'feel pain and understand affection and other feelings'. According to him a plant treated with care and affection gives out a different vibration compared to a plant subjected to torture

8 Ācārya Bose also proved that plants had finer senses like responding to melodious music and harsh noise. He showed that with the former the plants grow faster while with the latter their growth is stunted.

9 Ācārya Bose not only gives a strong scientific basis for the traditionally known and accepted fact of plants having life but also takes the knowledge further with his scientific acumen to its logical corollaries.

10 Gradually through advanced experiments he also proved that even the nonliving matters like metals and stones respond to stimuli (though very inertly) in a way similar to the muscular responses of the living.

11 Ācārya's research starting with the investigation of the plants, applying his expertise in Physics to them, thus systematically and naturally culminates in proving the age-old humanist faith in the basic unity of all life which ancient *vedantins* like *ādi śankarācārya* promulgated through their treatises as the doctrine of 'A-dvaita' meaning 'nonduality'. They believe that the ever-existent (*sat*), ever-sentient (*cit*), and all-pervasive (*sarvavyāpi*) Brahman alone is the root cause of the universe, both living and nonliving.

The scientific principles underlying the art under unfavourable political circumstances came to be forgotten and agriculture instead of being a concern of the state, a matter of expert knowledge, came to be the occupation of the lowest strata of the population with the result that the fertile India as noted by Megasthenes and others for its absolute absence of famine became repeated scenes of dearth and famine during Mohamedan rules again and again and many times during the British rule too.

In the upcoming paragraphs an effort has been laid to infer factually as to how medical science and agricultural science flourished in India and abroad based on *vedas*, which in itself at the first place is conclusive remarks and also a thought which can be taken ahead historically and also for the good of the upcoming generations!

The *vedic* texts reveal to us the science in its rudimentary stage while *caraka* and *suśruta*, exhibit it in its full-fledged development, its practical consummation. We have no materials sufficient to show us in detail the processes through which the transition from rudimentary stage of the science of which we get a picture, in the *atharvaveda* to the stage of its final development which we see in the *caraka* and *suśruta* took place, and we are left to vague conjectures and inferences. Only on hypothetical based on warrantable evidences can be made. Whatever may be the stages of it's development it is clear beyond all doubt that this useful science has not undergone any further since the time of *caraka* and *suśruta*. The later contribution on the subject rich as it is in quantity neither represents any improvement in quality nor a single step of advance in the theoretical aspects of the science as science and our attempt will necessarily be confined to a description of the direction taken by the science from its inception to its fullest development.

The first medical utterance of man is to be found in the text of the *rgveda* mainly, in the *ausdhisūktam*, of the tenth *mandala*, which gives us a description in detail of the variety of the use of to which plants used to be put. One hundred and seven applications are mentioned, but the number must not be taken literally but as a poetic statement of plurality. Here is the *sūktam*³⁶⁰ -

- 1 Herbs that sprang up in time of old, three ages earlier than the Gods,
of these, whose hue is brown, will I declare the hundred powers and seven
- 2 Ye, Mothers, have a hundred homes, yea, and a thousand are your growths
Do ye who have a thousand powers free this, my patient from disease
- 3 Be glad and joyful in the plants, both blossoming and bearing fruit,
Plants that will lead us to success like mares who conquer in the race
- 4 Plants, by this name I speak to you, mothers, to you the goddesses
steed, cow, and garment may I win, win back thy very self, O man

³⁶⁰ या ओषधी पोर्वा जाता देवेभ्य स्त्रियुग पुरा। मनै नु बभ्रूणामह शत धामानि सप्त च॥

त्वमुत्तमास्योषधे तव वृक्षा उपस्तय । उपास्तिरस्तु सोहमस्माक यो अस्मा अभिदासति॥ R V 10 97 1 23

- 5 The holy fig tree is your home, your mansion is the *parna* tree
Winners of cattle shall ye be if ye regain for me this man
- 6 He who hath store of herbs at hand like kings amid a crowd of men,-
physician is that sage's name, fiend-slayer, chaser of disease
- 7 Herbs rich in *soma*, rich in steeds, in nourishments, in strengthening power,
All these have I provided here, that this man may be whole again
- 8 The healing virtues of the plants stream forth like cattle from the stall,-
plants that shall win me store of wealth, and save thy vital breath, O man
- 9 Reliever is your mother's name, and hence restorers are ye called
Rivers are ye with wings that fly keep far whatever brings disease
- 10 Over all fences have they passed, as steals a thief into the fold
The plants have driven from the frame whatever malady was there
- 11 When, bringing back the vanished strength, I hold these herbs within my
hand,
The spirit of disease departs ere he can seize upon the life
- 12 He through whose frame, O plants, ye creep member by member, joint by
joint, - From him ye drive away disease like some strong arbiter of strife
- 13 Fly, spirit of disease, begone, with the blue jay and kingfisher
Fly with the wind's impetuous speed, vanish together with the storm
- 14 Help everyone the other, lend assistance each of you to each,
all of you be accordant, give furtherance to this speech of mine
- 15 Let fruitful plants, and fruitless, those that blossom, and the blossomless,
urged onward by *brhaspati*, release us from our pain and grief,
- 16 Release me from the curse's plague and woe that comes from *varuna*,
Free me from *yama's* fetter, from sin and offence against the Gods
- 17 What time, descending from the sky, the plants flew earthward, thus they
spake No evil shall befall the man whom while he liveth we pervade,

- 18 Of all the many plants whose king is, *soma*, plants of hundred forms,
 thou art the plant most excellent, prompt to the wish, sweet to the heart
- 19 O all ye various herbs whose king is *soma*, that over spread the earth,
 urged onward by *brhaspati*, combine your virtue in this plant
- 20 Unharmd be he who digs you up, unharmd the man for whom I dig
 And let no malady attack biped or quadru ped of ours
- 21 All plants that hear this speech, and those that have departed far away,
 come all assembled and confer your healing power upon this herb
- 22 With *soma* as their sovereign lord the plants hold colloquy and say
 O king, we save from death the man whose cure a *brahman* undertakes
- 23 Most excellent of all art thou, O plant thy vassals are the trees
 Let him be subject to our power, the man who seeks to injure us

This hymn together with the one following it, namely, the hymn addressed to a plant used against a rival wife, and the *sūktam*³⁶¹, constitutes practically speaking the whole of the science or art, or both science and art of medicine as revealed in the *rgveda*. Here is the hymn to the plant against the rival wife-

These three hymns taken together give us in a nutshell a world of ideas/whole science in a few words. We get here the names of certain plants with *soma*, the king of plants at their head and *aśvāvatī somavatī urjayantī udojaśa aśvattha* and *palāśa* as powerful agencies of cure against diseases. Innumerable application of plants is referred to though not definitely named. We are told that plants used to be applied as medicines, both individually and collectively, against diseases, both natural and super-natural, against bodily infirmities as well as against cures and the like. We also come to learn that plants could be used by themselves as well as in association with incantations and prayers. The genesis of the whole body of medicine is given as divine, and the nature of the cure is clearly characterized as radical, permanent and comprehensive. We are given in brief either the condensation, a scientifically a

³⁶¹ त्वे ह यत्पितरश्चिन्न इन्द्र विश्वा

इम नरो मरुत सश्चतानु

क्षत्रमजर दुवोयु ॥ R V 7 18

nice epitome, or the germ of the science of the medicine, of the art of cure, of demonology and classification of plants or botany at once. Behind the wealth of poetry we get some solid facts of scientific importance. The whole thing has the air of a summary distinctly presupposing more elaborate statements, a knowledge of details. There is no vagueness, but freshness of the original revealed to us in an unmistakable language. Where are the details gone? There are either, to all intents and purposes lost or they existed in popular memory and were handed down in tradition from generation to generation till at last they came to be synoptically recorded in treatise, and the vedic texts quoted may be the synopsis of a synopsis.

But we have a harvest of details bearing on the subject of medicinal plants, their utilities, their classifications, the diseases against which they were applied, the association in which they were to be applied and the rest, and in the text of the *atharvaveda*.

These details seem to be an elaboration of what we get in a synoptical form in the three hymns which are quoted earlier from the *rgveda*. There are points of similarity between the two, nay, there is essential identity. The latter seems to be an only elaborate edition, a popular commentary of the former. How are we to explain this? Either the details of the *atharvaveda* must be a development from and a lengthy explanation of the things we get in the *rg*, or the *rg* hymns give us a summary of the things so universally known.

Technically, the scientific treatise dealing with medicinal problems in the *āyurveda* are the science of life. From the statement in the *suśrūta* and *caraka* and also the other medical treatises, it is clear beyond all possibility of doubt, that there must have existed a monumental treatise of the name marking the intermediate period of transition between the *rgveda* and *atharvaveda* on the one hand and *suśrūta* and *caraka* on the other. Without the hypothesis of the existence of such a work, a hypothesis which is very valid, the unbridgeable gulf— a gulf of probably a thousand years or more according to many distinguished scholars. Scholars opine

that the rudimentary science of medicine painfully gleaned out of the *vedic* texts and the fully developed and scientifically accurate works of *suśruta* and *caraka* cannot be explained. Some of the ancient authorities traced the origin of the last work to the *atharvaveda* and some to the *rgveda*, but the following statement occurring in the *caraka* seems to be decisive on the point

“If anybody inquires from which of the four *vedas*, *āyurveda*, that is the *veda* of life emanates? What is life? Why the treatise is called the science of life? Is it transient or permanent and what are the sub-divisions of the science of life, to whom it is open for study and why? A physician when thus interrogated of all the four *vedas*, should mention the *atharvaveda* emphatically as the *veda* of life, i.e., should point out the *āyurveda* as part of the *atharvaveda* for this reason that the *atharvaveda* has prescribed treatment by gift, expiation, sacrifice, atonement and fast as well as incantations and has prescribed treatment solely as conducive to the welfare of life, Etc.”

“It is called the *āyurveda* or the science of life because it enables us to understand what *āyu* or life is. If asked how it explains life, the answer is this - it is called *āyurveda* because it brings home to us the nature of *āyu* by characterization, by happiness, by misery, by good and evil and by positive and negative proofs.”

The *suśruta* coming after *caraka* precisely agrees with it in describing of the same genesis of *āyurveda*.

Those who hold to *rgvedic* origin of science of life pointed out to the repeated mention of *rudra* as the father of science of medicine in *rgvedic* texts (2.7.16). This view is echoed by later mythological literature, and the traditional association of *rudra* with a healing science has been systematically maintained. Whatever that may be, the *atharvavedic* origin of the science of life, the tracing of the genesis of the *suśruta* and *caraka* to the *atharvaveda* seems to be warranted by facts. The divisions of the science of the medicine as occurring in the *caraka* and *suśruta* are as follows

- Śalyatantra (Major surgery)
- śālākyatantra (Minor surgery)
- kāyacikitsā (Medicine)
- bhūtavidyā (Demonology)
- kaumāraśikṣā (science of paediatrics)
- agadatantra (Toxicology)
- rasāyana (the science that treats of prolonging life)
- vājīkaraṇa (the science of aphrodisiacs, that is to stimulate the sexual power)

The further story of science of medicine in India can be very briefly told. It is the story of monotony and stagnation and unfortunately it is a sign of no development, no progress, no practical addition, rather the spirit of inquiry and the desire of explanation, a hankering after the solution of each problem, the motive of searching, analysis and scrutiny or all gone. In the *hindu* science of medicine mythology with its vast array of gods and goddesses intrudes, and although the science has been practiced, and it is being practiced still with wonderful efficacy the progress has been arrested for good and all. The wonder of wonders is that the Indian science of medicine which was developed centuries before the modern science, of medicine, came into being, has stood so long the wear and tear of time, of revolutions of conquests and in all essentials is still as perfect as 'the most developed European system today' and, considered from the point of utility it is peculiarly useful and efficacious to the people of the land of its origin. The glory of it is that, it can still cope with any other system of medicine and at the misfortune and shame of it is that it has not received adequate attention and has not consequently undergone any improvement.

The thesis submitted is but a part of larger work, which is to follow. It is intended to serve as a mere sample of the kind of work which can be produced with the materials that can yet be gathered from the unexplored field of Indian literature.

and current traditions. The indebtedness of human civilization to plants and study of plant's life, is indeed very great, there is hardly any department of human culture or any phase of human civilization, whether it be pure poetry or pure philosophy or pure religion, science, art, language, dress and ornament, trade or agriculture, where plants and study of plant's life have not laid important part.

Our thesis contains, we hope, sufficient evidence, to show that knowledge of botany, developed on three different lines, firstly, in and through various philosophical speculation, secondly, as *bhesjavidya*, in and through the science of medicine, and thirdly as *vrksāyurveda*, in and through the science of agriculture. There are quotations from sources referring to some independent treatises or manuals of the science of the medicinal properties of plants, those of the science of agriculture as well as the works dealing with the treatment of plants and other topics falling within the province of botany. We have only glimpses of these manuals and works through the summaries and incidental references in other treatises which are non-botanical. Even that which survives or remains, clearly indicates, that the divisions of knowledge by water-tight compartments, was yet unknown.

The inter-relation among the sciences was universally recognized and the sciences and the arts developed together. The obstacle in the path of development of the botanical science as full-fledged science, was that scientific cognition and results of observation, were not kept sufficiently, distance from the popular notions, guesses and superstitions.

Our study tends to prove that science of plants and plant-life in India is one of the earliest, if not the earliest one. With it developed such collateral sciences as those of medicine and agriculture. We know a good deal more of the science of medicine than of the science of agriculture, its sister, and of the science of plant and plant-life, its mother. Our survey, however, shows that all these shared the same fate of a brilliant beginning, a marked progress to a certain stage and a tragic stagnation.

The field is vast and our survey is brief, but enough, we think to hold out the prospects of a rich harvest that can be reaped by the modern inquirer

The value of the work is primarily historical no doubt, enabling one as it does to be acquainted with the circumstances and the difficulties through which human knowledge and heart grew up, but it's value also consists in discovering different systems of nomenclature and classification, suggestive of different trends of human thought and national culture

The earliest mention of agriculture occurs in a hymn of the *ṛgveda*, which definitely shows us that India was peculiarly fit for agriculture which was then the staple industry of the country, the sole source of the supply of food and the universal occupation of the people. The northern India being very fortunate in supply of water owing to the existence of a net work of rivers, yielded crops with ease and in the highest section of the race, namely, the *brahmin rsi*, regarded agriculture as a holy and dignified occupation

The following hymn from the *ṛgveda*³⁶² shows that the agriculture constituted a theme of inspired speculation-

- We through the Master of the Field, even as through a friend, obtain what nourisheth our kine and steeds. In such may he be good to us
- As the cow yieldeth milk, pour for us freely, Lord of the Field, the wave that beareth sweetness, distilling meath, well-purified like butter, and let them Lords of holy law be gracious

³⁶² यस्त्वामग्र इतश्चते यतस्तुक्विन्ते अन्नं कृणवत्सम्मिन्नहन् । स मु द्युन्नैरभ्यस्तु प्रसक्षत्तव क्रत्वा जातवेदश्चिकित्वान् ॥ इधम यस्ते जभरच्छ्रमाणो महो अग्ने अनीकमा सपर्यन् । म इधान प्रति दोषामुपास पुष्यन्नयि मचते व्रन्नमित्रान् ॥ अग्निरीशे बृहत क्षत्रियम्याग्निर्वाजस्य परमस्य राय । दधानि रत्न विधते यविष्ठो व्यानुपङ्गात्ययि म्वधावान् ॥ यद्विद्धि ते पुरुषत्रा यविष्ठाचित्तिभिश्चकृमा कञ्चिदाग । कृधी प्वस्मो अदितेरनागान्व्येनामि शिश्रथो विष्वगग्ने ॥ महश्चिदग्र एनसो अभीक ऊवद्दिवानामुत मर्त्यानाम् । मा ते सखाय मदमिद्विषाम यच्छा तोकाय तनयाय श यो ॥ यथा ह त्यद्वसवो गौर्य चित्पदि पिताममुञ्चता यजत्रा । एवो ष्वस्मन्मुञ्चता व्यह प्र तार्यग्ने प्रतर न आयु ॥^{R V 4 12}

- Sweet be the plants for us The heavens, the waters, and full of sweets for us be air's mid-region May the field's Lord for us be full of sweetness, and may we follow after him uninjured
- Happily work our steers and men, may the plough furrow happily Happily be the traces bound, happily may he ply the goad
- *Śuna* and *sīra*, welcome ye this laud, and with the milk which ye have made in heaven Bedew ye both this earth of ours
- Auspicious *sītā*, come thou near we venerate and worship thee that thou mayst bless and prosper us and bring us fruits abundantly
- May *indra* press the furrow down, may *pūsan* guide its course aright May she, as rich in milk, be drained for us through each succeeding year
- Happily let the shares turn up the plough-land, happily go the ploughers with the oxen With meath and milk *parjanya* make us happy Grant us prosperity, *śuna* and *sīra*

This show us very clearly that the *āryans* by the time when the hymn was composed were settled in the fertile soil of north India and realised the vital importance of agriculture as a staple and national industry for which they took a good deal of care and for which the divine was invoked They seem to acquire also a sound knowledge of the science as it exists today and a nice handling of the instruments of agriculture, such as plough Etc

From another hymn quoted below it will appear that they had recourse to artificial water supply when necessary, and, as in modern Europe, used to employ horses as well as cattle in agricultural operations³⁶³

³⁶³ महत्तदुल्लं स्थविर तदासीद्येनाविष्टित प्रविवेशिथाप । विश्वा अपश्यद्वहुधा ते अग्रे जातवेदमन्वो देव एक ॥ को मा ददर्श कतम स देवो यो मे तन्वो बहुधा पर्यपश्यत् । क्वाह मित्रावरुणा क्षियन्त्यग्रेर्विश्वा समिधो देवयानी ॥ ऐच्छाम त्वा बहुधा जातवेद प्रविष्टमग्रे अप्स्वोपधीषु । त त्वा यमो अचिकेच्चित्रभानो दशान्तरुष्यादतिरोचमानम् ॥ होत्रादह वरुण विभ्यदाय नेदेव मा युनजन्नत्र देवा । तस्य मे तन्वो बहुधा निविष्टा एतमर्थं न चिकेताहमग्नि ॥ एहि मनुर्देवयुयञ्जकामोऽरकृत्या तमसि क्षेप्यग्रे । सुगान्पथ कृणुहि देवयानान्वह हव्यानि सुमनस्यमान ॥ अग्रे पूर्वे भ्रातरो अर्थमेत रथीवाध्वानमन्वावरीवु । तस्माद्विष्या वरुण

- 1 Wake with one mind, my friends, and kindle *agni*, ye who are many and who dwell together *Agni* and *aadhikīās* and dawn the Goddess, you, Gods with Indra, I call down to help us
- 2 Make pleasant hymns, spin out your songs and praises build ye a ship equipped with oars for transport Prepare the implements, make all things ready, and let the sacrifice, my friends, go forward
- 3 Lay on the yokes, and fasten well the traces formed is the furrow, sow the seed within it Through song may we find bearing fraught with plenty near to the ripened grain approach the sickle
- 4 Wise, through desire of bliss from Gods, the skilful bind the traces fast, and lay the yokes on either side
- 5 Arrange the buckets in their place securely fasten on the straps We will pour forth the well that hath a copious stream, fair-flowing well that never fails
- 6 I pour the water from the well with pails prepared and goodly straps, unfailling, full, with plenteous stream
- 7 Refresh the hoises, win the prize before you equip a chariot fraught with happy fortune Pour forth the well with stone wheel, wooden buckets, the drink of heroes, with the trough for armour
- 8 Prepare the cow-stall, for there drink your heroes stitch ye the coats of armour, wide and many Make iron forts, secure from all assailants let not your pitcher leak stay it securely
- 9 Hither, for help, I turn the holy heavenly mind of you the Holy Gods that longs for sacrifice May it pour milk for us, even as a stately cow who having sought the pasture, yields a thousand streams

दूरमाय गौरो न क्षेप्रोरविजे ज्याया ॥ कुर्मस्त आयुरजर यदग्रे यथा युक्तो जातवेदो न रिष्या । अथा वह्नासि सुमनस्यमानो भाग देवेभ्यो हविष मुजात ॥ प्रयाजान्मे अनुयाजोश्च केवलानूर्जस्वन्त हविषो दत्त भागम् । घृत चापा पुरुष चौपधीनामग्रेश्च दीर्घमायुरस्तु देवा ॥ तव प्रयाजा अनुयाजाश्च केवल ऊर्जस्वन्तो हविष सन्तु भागा । तवाग्रे यज्ञोऽयमस्तु सर्वस्तुभ्य नमन्ता प्रदिशश्चतस्र ॥^{R V 10 51}

- 10 Pour golden juice within the wooden vessel with stone-made axes fashion ye
and form it Embrace and compass it with tenfold girdle, and to both chariot-
poles attach the car-horse
- 11 Between both poles the car-horse goes pressed closely, as in his dwelling
moves the doubly-wedded Lay in the wood the Soviran of the Forest, and
sink the well although ye do not dig it
- 12 Indra is he, O men, who gives us happiness sport, urge the giver of delight to
win us strength bring quickly down, O priests, hither to give us aid, to drink
the Soma, Indra Son of *nishigiri*

The following quotations go to show lands used to be distributed among cultivators
by measurement, a fact which is full of meaning- 'measure the land with a rod'

This noble pursuit was so well conducted and the agricultural products so
plenty that hospitality came to be regarded as a holy duty religiously enjoined an
ideal which is upheld in India even today The following quotations powerfully bear
on the following points³⁶⁴ -

- 1 The Gods have not ordained hunger to be our death even to the well-fed man
comes death in varied shape The riches of the liberal never waste away,
while he who will not give finds none to comfort him

³⁶⁴ न वा उ देवा क्षुधमिद्वध ददुरुताशितमुप गच्छन्ति मृत्यव । उतो रयि पृणतो नोप दस्यत्युतापृणन्मर्दितार न विन्दते ॥ य
आधाय चक्रमानाय पित्वोऽन्नवान्मन्त्रफितायोपजग्मुपे । स्थिर मन कृणुते सेवते पुरोतो चित्स मर्दितार न विन्दते ॥ स इद्भोजो यो
गृह्वे ददात्यन्नकामाय चरते कृशाय ।

अरमस्मै भवति यामहूता उतापरीषु कृणुते सखायम् ॥ न स सखा यो न ददाति सख्ये सचाभुवे सचमानाय पित्व ।
अपास्मात्प्रेयान्न तदोको अन्ति पृणन्तमन्यमरण चिदिच्छेत् ॥ पूणीयादिन्नाधमानाय तव्यान्द्वाधीयाममनु पश्येत पन्थाम् । ओ हि
वर्तन्ते रथ्येव चक्रान्यमन्यमुप तिष्ठन्त राय ॥ मोघमन्न विन्दते अप्रचेता मत्य ब्रवीमि वध इत्स तस्य । नार्यमण पुष्यति नो
सखाय केवलाधो भवति केवलादी ॥ कृषन्निर्त्तफाल आशित कृणोति यन्नध्वानमप वृङ्क्ते चरित्रै । वदन्नह्नावदतो
वनीयान्पृणन्नापिरपृणन्तमभि प्यात् ॥ एकपाद्भूयो द्विपदो वि चक्रमे द्विपात्रिपादमभ्येति पश्चात् । चतुष्पादेति द्विपदामभिन्वरे
सम्पश्यन्पङ्क्तीरुपतिष्ठमान ॥ समौ चिद्धस्तौ न सम विविष्ट सम्मातरा चिन्न सम दुहाते । यमयोश्चिन्न ममा वीर्याणि ज्ञाती
चित्सन्तौ न सम पृणीत ॥ ९ ॥^{R V 10.117}

- 2 The man with food in store who, when the needy comes in miserable case
begging for bread to eat, hardens his heart against him-even when of old he
did him service-finds not one to comfort him
- 3 Bounteous is he who gives unto the beggar who comes to him in want of
food and feeble Success attends him in the shout of battle He makes a friend
of him in future troubles
- 4 No friend is he who to his friend and comrade who comes imploring food,
will offer nothing Let him depart-no home is that to rest in-, and rather seek
a stranger to support him
- 5 Let the rich satisfy the poor implorer, and bend his eye upon a longer
pathway
Riches come now to one, now to another, and like the wheels of cars are ever
rolling
- 6 The foolish man wins food with fruitless labour that food -I speak the truth-
shall be his ruin He feeds no trusty friend, no man to love him All guilt is he
who eats with no partaker
- 7 The ploughshare ploughing makes the food that feeds us, and with its feet
cuts through the path it follows Better the speaking than the silent Brahman
the liberal friend out values him who gives not
- 8 He with one foot hath far outrun the biped, and the two-footed catches the
three-footed Four-footed creatures come when bipeds call them, and stand
and look where five are met together
- 9 The hands are both alike their labour differs The yield of sister milch-kine is
unequal Twins even differ in their strength and vigour two, even kinsmen,
differ in their bounty

The art of agriculture as it can be gleaned from the verses of the *atharvaveda* is practically a reproduction of what we get in the three other *vedas*³⁶⁵

- 1 Wise and devoted to the Gods the skilful men bind plough-ropes fast, and lay the yokes on either side
- 2 Lay on the yokes and fasten well the traces formed is the furrow, sow the seed within it Viñāj vouchsafe us heaving fraught with plenty! Let the ripe grain come near and near the sickle
- 3 The keen-shared plough that bringeth bliss, furnished with traces and with stilts, shears out for me a cow, a sheep, a rapid drawer of the car, a blooming woman, plump and strong!
- 4 May Indra press the furrow down, may *pūshan* guard and cherish her May she, well stored with milk yield milk for us through each succeeding year
- 5 Happily let the shares turn up the plough land, the ploughers happily follow the oxen Pleased with our sacrifice, *śuna* and *sīra*! Make the plants bring this man abundant produce
- 6 Happily work our steers and men! May the plough furrow happily, happily be the traces bound Happily ply the driving-goad
- 7 *Śuna* and *sīra*, welcome ye this laud, and with the milk that ye have made in heaven, Bedew ye both this earth of ours
- 8 Auspicious *sītā*, come thou near we venerate and worship thee That thou mayst bless and prosper us and bring us fruits abundantly

³⁶⁵ मीरा युञ्जन्ति कवयो युगा वि तन्वते पृथक् । धीरा देवेषु सुम्रयौ ॥ युनक्त सीरा वि युगा तनोत कृते योनौ वपतेह बीजम् । विराज श्रुष्टि सभरा असन् नो नेदीय इत् सृण्य पक्वम् आ यवन् ॥ लाङ्गल पवीरवत् सुशीम सोमसत्सरु । उद् इद् वपतु गाम् अवि प्रस्थावद् रथवाहन पीवरी च प्रफर्व्यम् ॥ इन्द्र सीता नि गुह्यात् ता पूपाभि रक्षतु । सा न पयस्वती दुहाम् उत्तरामुत्तरा समाम् ॥ शुन सुफाला वि तुदन्तु भूमि शुन कीनाशा अनु यन्तु बाहान् । शुनामीरा हविषा तोशमाना सुपिप्पला ओपधी कर्तम् अम्मै ॥ शुन बाहा शुन नर शुन कृपतु लाङ्गलम् । शुन वरत्रा वध्यन्ता शुनम् अट्टाम् उद् इङ्गय ॥ शुनामीरेह स्म मे जुपेथाम् । यद् दिवि चक्रथु पयस् तेनेमाम् उप सिञ्चतम् ॥ मीते वन्दामहे त्वार्वाची सुभगे भव । यथा न मुमना असो यथा न सुफला भुव ॥ घृतेन मीता मधुना समक्ता विश्वैर् देवैर् अनुमता मरुद्भिः । सा न सीते पयमाभ्याववृत्स्वोर्जस्वती घृतवत् पिन्वमाना ॥ ^{AV}

- 9 Loved by the *visvedevas* and the *maruts*, let *sītā* be bedewed, with oil and honey Turn thou to us with wealth of milk, O *sītā*, in vigorous strength and pouring streams of fatness

There is found a verse in *atharvaveda* which asks for the abundance of grains

- 1 The plants of earth are rich in milk, and rich in milk is this my word, so from the rich in milk I bring thousand fold profit hitherward
- 2 Him who is rich in milk I know Abundant hath he made our corn The God whose name is gatherer, him we invoke who dwelleth in his house who sacrifices not
- 3 All the five regions of the heavens, all the five races of man-kind, as after rain the stream brings drift, let them bring increase hitherward
- 4 Open the well with hundred streams, exhaustless, with a thousand streams So cause this corn of ours to be exhaustless, with a thousand streams
- 5 O Hundred-handed, gather up O Thousand-handed, pour thou forth Bring hither increase of the corn prepared and yet to be prepared
- 6 Three sheaves are the *gandharvas*' claim, the lady of the house hath four We touch thee with the sheaf that is the most abundant of them all
- 7 Adding and gathering are thy two attendants, O *prajāpati* May they bring hither increase, wealth abundant, inexhaustible

Reading the verses between the lines we can get a clear idea of the village construction with the 'village common' in the centre surrounded by habitations on all sides, whence people used to come when necessary to carry on the work

A charm to hasten the coming of the rains³⁶⁶

³⁶⁶ पयम्ब्वतीर् ओपधय पयस्वन् मामक वच । अयो पयम्ब्वतीनाम् आ भरे 'ह सहस्रश ॥ वेदाह पयम्ब्वन्त चकार धान्यम् बहु । सभृत्वा नाम यो देवम् त वय ह्वामहे योयो अयज्वनो गृहे ॥ इमा या पञ्च प्रदिशो मानवी पञ्च कृष्टय । वृष्टे शाप नदीर् इवेह स्फाति समावहान् ॥ उद् उत्स शतधार महस्रधारम् अक्षितम् । एवाम्माकेद धान्य सहस्रधारम् अक्षितम् ॥ शतहस्त ममाहर

- 1 Let all the misty regions fly together, let all the rain-clouds sped by wind,
assemble Let waters satisfy the earth, the voices of the great mist-enveloped
bull who roareth
- 2 Let them show forth, the strong, the bounteous *maruts* let plants and shrubs
be hung with drops of moisture Let floods of rain refresh the ground with
gladness and herbs spring various with each form and colour
- 3 Cause us who sing to see the gathering vapours outburst in many a place the
rush of waters! Let floods of rain refresh the ground with gladness, and herbs
spring various with each form and colour
- 4 Apart, Parjanya! let the troops of *maruts*, roaring, swell the song Let pouring
torrents of the rain that raineth rain upon the earth
- 5 Up from the sea lift your dread might, ye *maruts* as light and splendour, send
the vapour upward! Let waters satisfy the earth, the voices of the great mist-
enveloped bull who roareth
- 6 Roar, thunder, set the sea in agitation bedew the ground with thy sweet rain,
parjanya! Send plenteous showers on him who seeketh shelter, and let
the owner of lean kine go homeward
- 7 Let the boon *maruts*, let the springs and coiling serpents tend you well
Urged by the *maruts* let the clouds pour down their rain upon the earth
- 8 Let lightning flash on every side from all the regions blow the
winds! Urged by the *maruts* let the clouds pour down their rain upon
the earth
- 9 May waters, lightning, cloud, and rain, boon springs and serpents tend you
well Urged by the *maruts* let the clouds pour down their rain upon the earth

सहस्रहस्त म किर । कृतम्य कार्यम्य चेह स्फाति समावह ॥ तिस्रो मात्रा गन्धर्वाणा चतस्रो गृहपत्या । तासा या स्फातिमत्तमा
तया त्वाभि मृशाममि ॥ उपोहश् च ममूहश् च क्षत्तारो ते प्रजापते । ताव् इहा वहता स्फाति बहु भूमानम् अक्षितम् ॥ ^{AV 324}

- 10 May he who hath become the plants' high regent, suiting our bodies, *agni* of the waters, may *jātavedas* send us rain from heaven, *amrtam* and vital breath to earthly creatures
- 11 Sending up waters from the flood and ocean *prajāpati* move the sea to agitation! Forth flow the moisture of the vigorous stallion! With this thy roar of thunder come thou hither
- 12 Our father, Lord divine pouring the torrents Let the streams breathe, O *varuna*, of the waters Pour the floods down along the brooks and channels let frogs with speckled arms send out their voices
- 13 They who lay quiet for a year, the *brāhmanas* who fulfil their vows The frogs, have lifted up their voice, the voice *parjanya* hath inspired
- 14 Speak forth a welcome, female frog! Do thou O frog, accost the rain Stretch thy four feet apart, and swim in the middle of the lake
- 15 *Khanvakhā*, ho! *Khamakhā*, ho! thou in the middle, *tadurī*! Fathers, enjoy the rain from one who strives to win the *maruts* heart
- 16 Lift up the mighty cask and pour down water, let the wind blow, and lightning's flash around us Let sacrifice be paid, and, widely scattered, let herbs and plants be full of joy and gladness

The hymn which will be cited now from *atharvaveda* is also related to agricultural science which sheds light on the way our ancestor invoked gods and goddesses to get rid of pests and other crop-destroying creatures³⁶⁷

- 1 Destroy the rat, the mole, the boring beetle, cut off their heads and crush their ribs, O *asvins* Bind fast their mouths, let them not eat our barley so guard, ye twain, our growing corn from danger

³⁶⁷ हत तर्द ममङ्कम् आखुम् अश्विना छिन्त शिरो अपि पृष्टी शृणीतम् । यवान् नेद् अदान् अपि नह्यत मुखम् अथाभय कृणुत धान्याय ॥ तर्द है पतङ्ग है जभ्य हा उपक्रम । ब्रह्मेवामस्थित हविर् अनदन्त इमान् यवान् अहिमन्तो अपोदित ॥ तर्दापते वधापते तृष्टजम्भा आ शृणोत मे । य आरण्या व्यद्वरा ये के च स्थ व्यद्वरास् तान्त् मर्वान् जम्भयाममि ॥ ^{AV 6 50}

- 2 Ho! Boring beetle, ho! thou worm, ho! Noxious grub and grasshopper! As a priest leaves the unfinished sacrifice, go hence devouring not, injuring not this corn
- 3 Harken to me, lord of the female borer, lord of the female grub! Ye rough-toothed vermin! Whatever ye be, dwelling in woods, and piercing, we crush and mangle all those piercing insects

Barley as the staple food³⁶⁸

- 1 Spring high, O barley, and become much through thine own magnificence burst all the vessels, let the bolt from heaven forbear to strike thee down
- 2 As we invite and call to thee, barley, a God who heareth us, raise thyself up like heaven on high and be exhaustless as the sea
- 3 Exhaustless let thine out-turns be, exhaustless be thy gathered heaps, Exhaustless be thy givers, and exhaustless those who eat of thee

Protection and blessing of the cattle³⁶⁹

- 1 First, O *arundhati*, protect our oxen and milky kine Protect each one that is infirm, each quadruped that yields no milk
- 2 Let the plant give us sheltering aid, *arundhati* allied with Gods, avert Consumption from our men and make our cow-pen rich in milk

³⁶⁸ उच्छ्रयस्व बहुर् भव स्वेन महसा यव । मृणीहि विश्वा पात्राणि मा त्वा दिव्याशनिर् वधीत् ॥ आशृण्वन्त यव देव यत्र त्वाछावदामि । तद् उच्छ्रयस्व द्यौर् इव ममुद्र इवैध्य अक्षित ॥ अक्षिताम् त उपमदो क्षिता सन्तु राशय । पृणन्तो अक्षिता सन्तु अत्तार मन्तु अक्षिता ॥ A V 6 142

³⁶⁹ अनहुद्भ्यास् त्व प्रथम धेनुभ्यम् त्वम् अरुन्धति । अद्येनवे वयमे शर्म यच्छ चतुष्पदे ॥ शर्म यच्छत् ओपधि सह देवीर् अरुन्धती । करत् पयस्वन्त गोष्ठम् अयक्ष्मा उत पूरुपान् ॥ विश्वरूपा मुभगाम् अछावदामि जीवलाम् । मा नो रुद्रम्यास्ता हेति दूर नयतु गोभ्य ॥ A V 6 59

- 3 I welcome the auspicious plant, life-giving, wearing every hue Far from our cattle may it turn the deadly dart which *rudra* casts

Glorification and benediction of cows³⁷⁰

- 1 The kine have come and brought good fortune let them rest in the cow-pen and be happy near us Here let them stay prolific, many-coloured, and yield through many morns their milk for *indra*
- 2 *Indra* aids him who offers sacrifice and praise he takes not what is his, and gives him more thereto Increasing ever more and ever more his wealth, he makes the pious dwell within unbroken bounds
- 3 These are never lost, no robber ever injures them no evil-minded foe attempts to harass them The master of the kine lives a long life with these, the cows whereby he pours his gifts and serves the Gods
- 4 The charger with his dusty brow overtakes them not, and never to the shambles do they take their way These cows, the cattle of the pious worshipper, roam over wide-spread pasture where no danger is
- 5 To me the Cows seem *bhaga*, they seem *indra*, they seem a portion of the first poured *soma* These present cows, they, O ye men, are *indra* I long for *indra* with my heart and spirit

³⁷⁰ आ गावो अगमन् उत भद्रम् अक्रन्त् सीदन्तु गोष्ठे रणयन्त् अस्मे । प्रजावती पुरुषा इह स्युर् इन्द्राय पूर्वीर् उपमो दुहाना ॥ इन्द्रो यज्वने गृणते च शिक्षत उपेद् ददाति न स्व मुपायति । भूयोभूयो रयिम् इद् अम्य वर्धयन् अभिन्ने खिल्ये नि दधाति देवयुम् ॥ न ता नशन्ति न दधाति तम्करो नामाम् आमित्रो व्यथिर् आ दधर्षति । देवाश् च याभिर् यजते ददाति च ज्योग् इत् ताभि सचते गोपति सह ॥ न ता अर्वा रेणुककाटो 'श्रुते न मस्कृतत्रम् उप यन्ति ता अभि । उरुगायम् अभय तस्य ता अनु गावो मर्तस्य वि चरन्ति यज्वन ॥ गावो भगो गाव इन्द्रो म इच्छाद् गाव सोमस्य प्रथमस्य भक्ष । इमा या गाव स जनाम इन्द्र छामि हृदा मनसा चिद् इन्द्रम् ॥ यूय गावो मेदयथ कृश चिद् अश्रीर चित् कृणुथा मुप्रतीकम् । भद्र गृह कृणुथ भद्रवाचो वृहद् वो वय उच्यते सभासु ॥

प्रजावती सूयवमे रुशन्ती शुद्धा अप मुप्रपाणे पिवन्ती । मा व स्तेन ईशत माघशम परि वो रुद्रस्य हेतिर् वृणक्तु ॥ ^{AV 421}

- 6 O cows, ye fatten even the worn and wasted, and make the unlovely beautiful
to look on Prosper my home, ye with auspicious voices! Your power
is magnified in our assemblies
- 7 In goodly pasturage, bright-hued, prolific, drinking pure water at fair
drinking-places, never be thief or sinful man your master, and may the dart of
rudra still avoid you!

Thus by exhaustively providing *vedic* references, here we have tried to give an
elaboration of what our ancients' knowledge was regarding the botany and its allied
branches

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